

Railway Age Gazette

Including the Railroad Gazette and The Railway Age

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

W. H. BOARDMAN, *President.*

E. A. SIMMONS, *Vice-President.* HENRY LEE, *Sec'y & Treas.*
The address of the company is the address of the officers.

EDITORS:

W. H. BOARDMAN, <i>Editor.</i>	ROY V. WRIGHT	W. E. HOOPER
SAMUEL O. DUNN,	B. B. ADAMS	F. W. KRAEGER
<i>Editorial Director.</i>	G. L. FOWLER	H. H. SIMMONS
BRADFORD BOARDMAN,	WILLIAM FORSYTH	S. W. DUNNING
<i>Managing Editor.</i>	E. T. HOWSON	CLARENCE DEMING

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada.....	6.00
Foreign Edition (London).....	£1 12s. (8.00)
Single Copies.....	15 cents each

Shop Edition and the eight M. M. and M. C. B. Convention Daily Issues, United States and Mexico, \$1.50; Canada, \$2.00; Foreign, \$3.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOLUME 50. FRIDAY, FEBRUARY 24, 1911. NUMBER 8.

CONTENTS

EDITORIAL:

Editorial Notes.....	341
New York State Boiler Inspection.....	342
The Future of the Missouri Pacific.....	343
Institutional Railway Bond Investment.....	343
New Books.....	344

ILLUSTRATED:

The Baton Rouge Cut Off; Southern Pacific.....	345
The Brooks Spark Arrester.....	348
Mallet Locomotives on the Santa Fe.....	351
Belt Lines of the Chicago & North Western at Chicago and Milwaukee.....	354
Hill Track Level.....	359
Steel Sleeping Cars for the St. Paul.....	359

LETTERS TO THE EDITOR:.....

MISCELLANEOUS:

Work of Safety Committees on the Chicago & North Western.....	349
Train Accidents in January.....	351
The Genealogy of the New Haven.....	356
Superheated Steam in Locomotive Service.....	357
Extension of the Siberian Railways.....	361
Foreign Railway Notes.....	349, 358, 359, 361

GENERAL NEWS SECTION.....

SUPPLY TRADE SECTION.....

THE paper presented to the New York Railroad Club last Friday night on Wireless Telegraphy in Railroad Work must be regarded as a report if not exactly of progress, at least of a commencement. For the past four years the Union Pacific has kept the author of the paper, Dr. Frederick H. Millener, busy as an experimental electrician investigating the possibilities of adapting wireless telegraphy to railway service. The first attempt was to devise a cab signal that would indicate the position of the road signals, but it was found that, while it was quite feasible to design an apparatus that would work, it has, thus far, been impossible to design one that would work with the reliability that is required for that kind of service. The fact was brought out, too, that for short distance transmission the wireless installations would be more expensive than the wires, but for distances of more than 100 miles the reverse is true. The investigations have not been fruitless, for it is the intention of the Union Pacific to build two or more stations in order that there may be a certainty of maintaining communications when the wires are down. This is a condition that has to be met frequently on the plains, where the distances are not only very great, but severe storms are apt to cause wire troubles. In the discussion, some

data was given regarding the conditions of the static earth charges in the region where sparks across 2½-in. and 3-in. air gaps can frequently be obtained from earth discharges alone. It is these discharges, due to surcharges from a, perhaps, distant thunderstorm that cause the disabling of the signals; and it is in the avoidance of such things as this that one of the chief difficulties will be found in the use of the wireless along the lines of a railway. There was nothing stated to show that any practical railway work had, as yet been done with wireless, but merely that, to put it conservatively, attempts were being made to make a beginning.

THE conflict of the New York, New Haven & Hartford with the Grand Trunk, which opened last spring when the Grand Trunk secured a Rhode Island charter and permission to extend to Providence, has passed through a new legislative stage in Vermont, where a petition of the New Haven—or, more strictly speaking, the Boston & Maine—has fallen between the upper and lower houses. The New Haven wanted Vermont's permission to parallel in that state, on the west side of the Connecticut river, some 10 miles of the Vermont Central, the Grand Trunk's New England outlet. The lower house of the state voted affirmatively by a great majority; the senate by an emphatic majority killed the measure by amendment. As an outcome, the New Haven says it will shift to the other side of the river, build the 10 miles northward to Brattleboro under the New Hampshire general railway law and cut out the 10 mile link on which it is dependent. There is in northern Vermont a similar link of the Vermont Central, 14 miles long, between Windsor and White River Junction, which must also be similarly eliminated to give the New Haven its through northward line which it intends to double track throughout. With two links out, the Grand Trunk is compelled to build 50 miles between Windsor and Brattleboro. This "battle of the parallels" is one phase of the campaign. Another is the reported plan of diverting from the Grand Trunk to the Canadian Pacific the large annual traffic now supplied to the Grand Trunk by the Boston & Maine. And now comes the counter stroke of the New Haven, which, by securing half-control of the Rutland system along with the New York Central, invades Canada, and by traffic rights reaches Montreal. The next stage is not unlikely to be a movement by the Grand Trunk in Rhode Island to obtain legislative sanction for the use of the New Haven's terminal plants at Providence, which, the owning corporation asserts, are already fully worked.

A FEW weeks ago a railway officer with large interests on the Pacific slope was quoted as explaining the anti-railway sentiment of the people by his theory that the railway corporations had not "entered politics" enough. His idea, with its implication, was that the railway corporations had indulged overmuch their policy of aloofness; that they had stood too persistently on their dignity; had in too great degree ignored legislatures and commissions; and that the ultimate remedy was greater political activity at state capitals and more direct appeals to the voting constituencies. The advice had a strange sound and is historically hardly convincing. How often has the tongue of the anti-railway orator impugned the corporations for their political activities; told us how they have in the past "owned" legislatures and elected legislators; how in states like Kansas in the West, California on the Pacific coast, and Connecticut, Rhode Island and New Hampshire in the East, they were politically dominant; and how, party-wise, they followed the aphorism of Jay Gould, who was "a Democrat in a Democratic county, a Republican in a Republican county, and in every county an Erie man!" In the processes which led up to the anti-corporation sentiment, beginning a few years ago, were not the political forces overworked and the economic forces too much ignored? And is not the effective appeal now to economic facts the final remedy? Certainly the leading causes—high finance, the insurance scandals, evasions of the law in

rates—which brought on the popular reaction, were non-political. And ultimately must not the situation work itself out through the play, not of politics, but of the economic energies expressed in such terms as rates more just, labor less aggressive, railway law crystallized into more definite statutes, and commissions elevated in their personnel? Along those reformative lines, rather than political ones, railway "activity" can never run too fast or too far.

NEW YORK STATE BOILER INSPECTION.

IN the *Railroad Gazette* of September 13, 1907, and the *Railway Age Gazette* of June 17, 1910, we commented on the locomotive boiler inspection law of New York state and that proposed by the federal government, respectively. In regard to the former, the position taken was that the regulations proposed and since put in operation by the New York Public Service Commission, Second district, were simply an embodiment in legal form of those in force on railways whose standard of boiler maintenance was what it ought to be. The enforcement of the rules has shown that, as a general rule, the railways have little cause for complaint. Officers who were in a position to keep their boiler maintenance up to a high point may regard the law as a useless and constant outflow of certificates of inspection, or but one more addition to the many pin-prick annoyances to which they are subjected; while those whose idea of boiler maintenance were closely allied to neglect may possibly think the requirements so much fol-de-rol, but of these there are probably very few. The rules were drawn along the lines of first-class work, and certainly first-class work should be done. Granted, then, that the majority of managers and superintendents of motive power are agreed as to the desirability of high grade boiler maintenance, it is somewhat surprising to find that the commission is of the opinion that its supervision has served as a very decided preventative of that class of accident which is usually divorced from management or roundhouse responsibility and put on the shoulders of the careless runner.

Whether the position is a sound one or not, there certainly has been a marked falling off in the number of boiler accidents since the state regulations have been in force. In their last report we have the following list:

	1909.	1908.
Pocket flue blew out	0	1
Arch tube burst.....	0	1
Plugs and studs blew out: nuts stripped.....	0	4
Burst flue	0	1
Flue pulled out	1	1
Low water	4	11
Broken staybolts	1	0

It is acknowledged by the commission that this may be a mere coincidence, but it is urged, at the same time, in explanation of the falling off of low water accidents, that before the present regulations were put in force there were many that were due to the engineman being deceived as to the height of the water, because of defective fittings, and they emphasize the statement by referring to cases of low water that were undoubtedly the result of such defects. For instance, on one occasion an engineman maintained that the water was high because he had tried the gage cock and the issuing water had splattered and burned his wrist. Investigation showed that the drip was clogged and filled with water, and that the steam had thrown it out so that he was deceived. In another case the bottom opening of the water glass had become stopped, causing a false indication. It is because the law requires close attention to these minor details that the chances for such a deception are lessened; and, with this, low water failures are made fewer.

It is not that the state inspector or his assistant can personally inspect any large number of the 7,000 locomotive boilers of the state, but because they are apt to put in an appearance unexpectedly in out-of-the-way places that the moral effect is good and inspectors who might otherwise be slack in the performance of their duties are keyed up to doing careful and efficient work.

The state inspection must necessarily be far from complete because it is not the policy to put the railways to inconvenience, but it is made as thorough as circumstances will permit. Staybolts are examined for leaks and for plugged holes; the injectors are tested to see that they are in proper working condition; the water glass and gage cocks are examined to make sure that they are clean; the registration of the steam gage and the opening of the safety valves are checked, and so on. Sometimes such an inspection develops startling conditions, as when a nest of 41 broken staybolts was found in a boiler, or a score were found plugged because they leaked. All of this has a healthy influence on the railway inspectors.

Occasionally an inspector is so imbued with loyalty to his railway that he neglects that strict adherence to the truth which a statement under oath would imply, and it has been found to be necessary to have a few transferred to other duties. In some cases incompetent men were at work who were really unable to detect defects.

As we have said before, the state inspection would be a superfluity if all railway inspectors did their whole duty at all times and every railway management insisted on a high grade of maintenance. But this condition seems to be rare, and it is especially lacking on the small roads where the officers are inexperienced in railway affairs and ignorant of things mechanical. They do not realize the danger of neglect, and will take hair-raising chances, as in a case where a boiler was found to be at work with the shell corroded to a thickness of barely one-sixteenth of an inch.

It is in this service as a check that the value of the work of the New York commission is to be found. It is an independent authority that cannot be hampered by the desire of the superior officers to make a showing, and it has been of great assistance to the mechanical department, in some cases, where the financial control was inclined to cut down expenses to a point very close to the danger limit. There is the authority to issue an order, but so smoothly have things been carried on that it has only been found necessary to issue one; requests and suggestions have served in every other case. That the regulations have been suited to the work to be done, and have been satisfactory to the railways and the commission, seems to be borne out not only by the smoothness and the lack of friction with which they have been administered, but also by the fact that they have been adopted verbatim by the commissions of Ohio and Pennsylvania, and have been put in force in Canada.

The gist of the situation is this: the rules set up no new conditions; they did not require that the railways should do any other thing than live up to their own professions of faith in their daily practice. They did not interfere with the regular routine of shop and roundhouse work, but merely required that that routine should be regularly and systematically followed. The inspections of the state employees are not to take the place of the railways' men, but simply to serve as a check to hold those men up to concert pitch.

Of course the rules are not perfect. No one claims that they are. Nothing of this sort can be of universal application and value any more than any other attempted panacea. A rule that would require washing out at 30 day intervals in the Adirondacks may be unnecessary, while when applied to boilers coming in from Ohio and Pennsylvania prove quite insufficient to meet the necessities of the case. The common sense of the commission and the railways allow for local conditions, and expects that the boilers in bad water districts will receive the extra attention that they demand.

It would seem, then, that this sort of inspection, or rather this checking of railway inspection, is of value, and of greater advantage, possibly, to the railways than to the public, while the burden on the latter is limited to the salaries and traveling expenses of two men. If, then, this law has been so satisfactorily administered in a state, why would it not be of equal value in the hands of the federal government?

THE FUTURE OF THE MISSOURI PACIFIC.

GEORGE J. GOULD'S retirement from the presidency to the chairmanship of the Missouri Pacific is understood to mark the termination of his active management of the property. The change was due to the feeling of others who were largely interested in the property, principally Kuhn, Loeb and their associates, that its affairs were not being well conducted. The Missouri Pacific runs through a rich territory in Missouri, Kansas and Nebraska. It has great potentialities. But its possibilities have not been adequately developed in recent years. In physical condition and in financial results it has lagged behind not only other roads equally well situated but others far less favorably situated. Between 1880 and 1891 it paid dividends ranging from 1½ to 7 per cent. It suspended dividend payments in 1891, but renewed them in 1901, paying 5 per cent. until 1908. In the latter year it declared a dividend in stock, and it has paid none since. Its earnings and operating expenses show why it has thus fallen behind. It may, perhaps, be fairly compared with a group of roads composed of the Southern Pacific, the Santa Fe, the Rock Island, the St. Louis & San Francisco, the Missouri, Kansas & Texas, the Kansas City Southern and the Denver & Rio Grande.

The average gross earnings per mile of these roads, including in the group the Missouri Pacific itself, in the five years ended June 30, 1905, were \$7,097, and in the five years ended June 30, 1910, they were \$8,738, the amount for the second five-year period being 23 per cent. more than for the first five-year period. The average gross earnings of the Missouri Pacific itself in the first period were \$6,578 and in the second period \$7,222, an increase of but 10 per cent. This was the smallest increase shown by any road in the group. The average net earnings per mile of the group in the first five years were \$2,444, and in the second period \$2,924, an increase of 20 per cent. Every road in the group showed an increase except the Missouri Pacific, whose net earnings were \$2,257 in the first period, and were \$2,141 in the second period, a decrease of 5 per cent.

The expenditures per mile for maintenance of way and structures by the group during the first five years were \$990, and during the second five-year period \$1,169. Those of the Missouri Pacific were \$865 and \$1,001, respectively. The expenditures per mile of the group for maintenance of equipment during the first period were \$854 and during the second period \$1,182. Those of the Missouri Pacific were \$750 and \$984, respectively. This is one way of saying that the road has been under a management which has retained completely the authority, but has not been near enough to the property to exercise this authority judiciously. The result has been that the Missouri Pacific is today in bad physical condition; its operating force is not strongly organized; and the traffic department, with a natural right to get a large share of the business in a highly competitive territory, has been unable to make a fair bid for the business that properly belongs to it.

The Missouri Pacific itself does not own an absolute majority of the stock of any of the other so-called Gould roads, with the exception of the St. Louis, Iron Mountain & Southern; and in speaking of the Missouri Pacific throughout these comments we mean Missouri Pacific and St. Louis, Iron Mountain & Southern. The Missouri Pacific owns 45.5 per cent. of the Denver & Rio Grande common stock outstanding and 17.7 per cent. of the Denver & Rio Grande preferred. The preferred and common stock have equal voting power, and there is a total of \$38,000,000 common and \$49,779,800 preferred outstanding. The Missouri Pacific owns 5 per cent. of the outstanding Wabash preferred, and the Iron Mountain owns an additional 20 per cent., making a total of 25 per cent. The Iron Mountain owns slightly over 5 per cent. of Wabash common. The common and preferred have equal voting rights, and there is \$38,189,200 preferred and \$53,189,300 common. In addition to this, the Missouri Pacific owns a considerable interest in Texas & Pacific and holds in its treasury \$23,668,000 T. & P. second income

bonds. In the present state of legislation in Texas, however, these T. & P. bonds are not a quick asset. It will be seen that, regardless of the holdings of the Gould estate, the Missouri Pacific owns a sufficient portion of stock of the D. & R. G., its western connection, and the Wabash, its eastern connection, to have a large, if not controlling, voice in the affairs of the two roads.

Within the past fiscal year the Missouri Pacific and the Iron Mountain were reorganized and a new comprehensive mortgage was placed on the Missouri Pacific. This first and refunding mortgage authorizes the issue of \$175,000,000 bonds, of which \$29,806,000 are now outstanding. This leaves a large margin for the future issue of bonds, but this margin is needed. It will require the expenditure of a great many millions of dollars to put the property in the physical condition which its geographical location and traffic possibilities warrant. The Goulds have been skillful financiers, if not successful operating officers, and the financial reorganization that they carried out last year has put the company in a position to take advantage of strong backing by bankers; this backing is now supplied by the interest that Kuhn, Loeb & Co., of New York, and the Deutsches Bank, of Berlin, have taken. The extent of the resources of these bankers and the quality of their courage and foresight has been shown by Kuhn, Loeb & Company's relations with the Union Pacific; in fact, it is a fairly accurate comparison to contrast the Union Pacific, at the time E. H. Harriman took hold of it, with the Missouri Pacific today. With ample funds for improvement and an able operating officer, who shall live and work on and with the property, the Missouri Pacific has at least as great possibilities as had the Union Pacific.

INSTITUTIONAL RAILWAY BOND INVESTMENT.

THE institutional investment has long been recognized as one of the major factors, if not the major factor, in the absorption of securities, including those of the railways. As compared with individual and trustee investment it, of course, cannot be accurately measured. But it has an absolutely important significance in two directions: It represents, in the first place, investment which as a whole may be fairly regarded as conservative and, in the case of bonds, held usually to maturity; secondly, it absorbs, generally, securities in large blocks as distinguished from the smaller marketings of the individual. Beginning at the top with the mutual savings banks, the typical big savings institutions of our eastern states, the trend and variations of institutional investment as set forth in the recent report of the comptroller of the currency became informative. The returns from 1909 are as of April 28 for holdings; those from 1910 as of June 30. But the difference in the date is not material, as it would be, for example, in the case of railway earnings.

The returns show a decrease during the 14 months of holdings of railway bonds by all banking institutions—national, state, mutual savings, stock savings, private banks and trust companies—from \$1,551,160,520 to \$1,455,100,000, or somewhat more than 6 per cent. But the great loss is in the national banks (\$43,825,242) and in the trust companies (\$49,904,241), while the ultra conservative institutions, the mutual savings banks, actually increase their holdings of railway bonds from \$743,425,893 to \$747,800,000. The increase is small, and contrasts somewhat strikingly with a gain of about 6 per cent. in the railway bond holdings of the same class of banks in 1909 as compared with the previous year in the ratio of railway investments to total resources. But, on the other hand, the gain, small as it is, contrasts impressively with a drop in 1910 as compared with 1909 of \$42,499,502 in the savings bank holdings of state, county and municipal bonds, which are even more conservative than those of the railways. Taking banking institutions of all classes, railway bonds shows a decrease of between 6 and 7 per cent. as stated; state, county and municipal bonds, a decrease somewhat less than 5 per cent.; and public service corporation bonds, excluding

steam railways, but including street railways, show an increase of about 5 per cent.

The clear inference from the figures is that the so-called "municipal" investment of banking institutions is drifting backward in spite of the high security—this because the rate of interest return still remains low in spite of the notable increase during the last year, that steam railway securities are more than holding their own in absolute figures, but not holding their former increment; and that the new drift of banking investment is toward the minor and localized public service corporations. If this last form of banking investment could be analyzed more closely and sub-divided it would probably be found that the street railways are at the front. Many of them have passed their tentative stage and state banking commissions are opening them more and more to savings bank investment, for example in Massachusetts. They are still expanding prosperously in such regions as Texas and the Pacific states. Finally, as a closing and cogent argument for the investor, they make a higher interest return, partly because market for these securities is narrower and more localized, although, through eastern agencies, it is now beginning to expand. The early investment prejudice against tractions is obviously diminishing, and they are competing more and more in the investment market with steam railway as well as municipal bonds of the class held by the banks.

If that competition were due to natural economic conditions further comment would be called for. But it is in fact due much to artificial conditions.

Outside of the steam companies other public service corporations—light, power, water, street railway and the rest—are many of them subject to the supervision of state commissions. But many of them are not; and very few of them—almost none outside of street railways—are of an interstate character bringing them under federal regulation. Their relation to public necessity and convenience is intensive, to be sure. But, as a rule, they are small corporations, a fact that gives them a certain immunity, from a state commission. The steam railway is not only a big target in itself, but the victim of a double barrelled gun. State and interstate commission equally assail it, local and federal authority claim, except in the case of the smaller intrastate lines, jurisdiction over it. That is the point where an inequity reflects itself in the railway bond and to the advantage of competitors—still more so in railway stocks. The most conservative, municipal bonds excepted, of our institutional investments carries thus a double load in the investment rivalries of the market, as though compulsory rates and higher cost of supplies and increased wages were not enough. The same power that diminishes net earnings encourages financial competition.

There is yet another aspect of institutional investment states, counties, cities, towns and school districts must borrow money like the railways. The federal return shows that the holdings of their bonds by the banks are falling off fast, and it is a familiar fact that when a municipality does borrow now it must be at an interest rate increased something like a quarter of one per cent., as compared with three or four years ago. Does it ever occur to the average citizen that the hue and cry against the railways and the public procedure that have forced the railway bond's interest return up have forced up by its competition the municipal bond interest rate too? There's food for thought in that suggestion for the taxpayer and municipal financiers when they consider the marketing nowadays of a new loan for a public improvement.

NEW BOOKS.

Freight Train Resistance. Its Relation to Average Car Weight. By Edward C. Schmidt, professor of railway engineering. Bulletin No. 43, University of Illinois, Engineering Experiment Station, Urbana, Ill. Paper, 5 3/4 in. x 9 in., 152 pages; 52 illustrations; 60 tables.

The principal figures and conclusions in this bulletin were presented in a paper read at the May, 1910, meeting of the American Society of Mechanical Engineers, Atlantic City, N. J.,

and at the 1910 convention of the American Railway Master Mechanics' Association. The bulletin contains the full details of each test, including tables and diagrams, making a complete record of a most exhaustive investigation of freight train resistance with relation to the weight of cars. The conclusions differ from those of other investigators in this field, principally in showing the greater resistance per ton for light cars, and a greater increase in resistance of any train, with speed, than has been found by the test departments of some of the larger railways.

Heat. By J. Gordon Ogden, Ph.D. 116 pages; 4 3/4 in. x 6 3/4 in. Popular Mechanics Company, Chicago. Price, 25 cents.

In this little volume the subject of heat is treated much after the manner in which "familiar science" has been taught in the public schools. It describes the effect of heat on bodies and is illustrated with views of simple laboratory apparatus. There are no tables and little that would give one a working knowledge of the subject of heat. While it is interesting reading for a young student, it is of little use as a text book.

Letters to the Editor.

THE EFFICIENCY ENGINEER.

PITTSBURGH, Pa., February 14, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your articles and contributions about the efficiency engineer are enough to arouse the enthusiasm of a young and progressive engineer like myself. The older engineers had to blaze a way for themselves, but we young and actively engaged men find many examples and much information at our hands. While the able writers, in your current number, evidently have this subject thoroughly at their fingers' ends, as it were, there are many of us still groping for help to better work.

What strikes the writer is that he is not acquainted with a single efficiency engineer. While to confess this is a humiliation, yet it is the truth. The writers in your journal on both sides of the question seem to know their haunts and their works, and it would be invaluable information to many of us, college bred or self educated, or whatever we may be, striving for help to render more and better service, to know all about the efficiency engineers, and primarily to know: (1) Their names and addresses; (2) their specialty and their training; (3) the work they have performed and are performing, with exact particulars, dates and results, so that one may judge of the reality of the efficiency engineer.

It will not suffice to give the names of skilled observers, employed to check time and to work at special lines under directions. No works, no railway, is without such observers: such men often make valuable suggestions, but we seek the able, competent efficiency engineers directing and using such observers and employing all other known methods to increase efficiency in order to get better results. That they are many and able, and that they must be all around us doing their good work, perhaps without great desire for publicity, there can be no room for doubt.

It must be that such men, working and always accomplishing, obtain a great reward for themselves: it must be that the better known they become the greater will be their reward. The reward, let it be money or fame, is what, after all, we seek. These men then will only too gladly let themselves and their works be known. It will be most interesting to see plainly published in your valuable paper, exact particulars, without any "glittering generalities."

We beg then that regardless of the side of the question taken by your able contributors and writers, that they shall tell us who are the "efficiency engineers" and of their works, especially as indicated above.

ENGINEER.

BATON ROUGE CUT-OFF; SOUTHERN PACIFIC.

In the operation of the Southern Pacific properties there has long been apparent a necessity for a line to avoid the detour of certain traffic through New Orleans. In 1885 the late C. P. Huntington proposed to build a line from Lafayette, La., to Baton Rouge, but his associates did not concur, and the project was abandoned. In 1902 the late E. H. Harriman became interested in the idea and surveys were then made under the direction of G. W. Boshcke. In 1905 the construction of the road was authorized, and on January 1, 1906, the grading was begun. The line was opened for operation January 15, 1911.

The saving in mileage by this short line will be considerable. The drawing shows the situation. From Lafayette to New Orleans is 145 miles. From New Orleans to Baton Rouge is 90 miles. By the short line, the distance from Lafayette to Baton Rouge is 57 miles, a saving of 178 miles on the route from Lafayette to Memphis. The Baton Rouge, Hammond & Eastern affords a direct connection with the main line of the Illinois

said junction to the Gulf of Mexico at the mouth of the Atchafalaya is only 150 miles, hence the flood waters of the Mississippi and Red rivers pass with considerable velocity through this short outlet to the sea. The basin is perhaps an original sea marsh through which the Red river has pushed its way, building up its banks and gradually raising the surface of the marsh with the sedimentation incident to annual freshets. The general elevation of this basin is about five feet above sea level. The bottom of the Atchafalaya is 45 ft. below sea level. The banks of the river are about eight feet higher than the general level of the basin. This basin varies from six to seventeen miles in width. To get a direct line it was necessary to cross this basin along the line of its greatest width. During flood periods in the Mississippi river, the waters flow out of the main Atchafalaya channel and gradually fill this immense basin to a depth of about 8 ft. These waters generally begin to rise in January and the flood period extends to September, so that there are normally only three months in the year when the ground surface is visible. Even when the surface is not flooded the ground is saturated and



Pile Drivers at Work on Trestle; Southern Pacific.

Central at Hammond. The distance from Lafayette to Hammond via Baton Rouge is 102½ miles, and via New Orleans is 198 miles, a saving of 95½ miles. A connection with the Queen & Crescent system by use of the New Orleans Great Northern from Covington is a possibility. The distance from Slidell to Lafayette via New Orleans is 181 miles; via Baton Rouge it is 154 miles, a saving of 27 miles. This new line will thus be an important factor in the transportation problems not only of this locality but also of transcontinental service.

Some features of the construction were uncommon. As indicated on the map, the direction of the line is squarely across the general trend of the drainage of the territory through which it passes. The principal waterway crossed is the Atchafalaya river. This river is an affluent of the Mississippi, and during certain flood stages it serves as an outlet for probably one-fifth of the water of the Mississippi as well as for the water of the Red river. From the junction of the Atchafalaya and the Mississippi to the jetties at Southwest Pass is 315 miles. From the

soggy. This condition made it impracticable to use the usual methods in constructing the roadbed. As the entire country was flooded, the working force, as well as all materials for the work and supplies for the men, had to be transported by steamboats from Morgan City. The hull of an old ocean steamship was converted into a quarter boat and towed through a network of lakes, bays and bayous to the right of way, in order to afford accommodations to the engineers and working forces.

In building the roadbed, three methods were pursued. In the western section the line was first cleared for a width of 25 ft. During the progress of this work the floods came on, and the trees were then cut about 10 ft. above the ground. The next step was to build a temporary trestle westward from Bay Poulet. Meantime the road had been graded and track laid through the highlands on the west end of the line, and a pile driver was started at the western limit of the swamp, working toward the force which was working in the swamp. The photographs give a fair idea of the appearance of the work at this



Right of Way Cleared for Pile Driver.



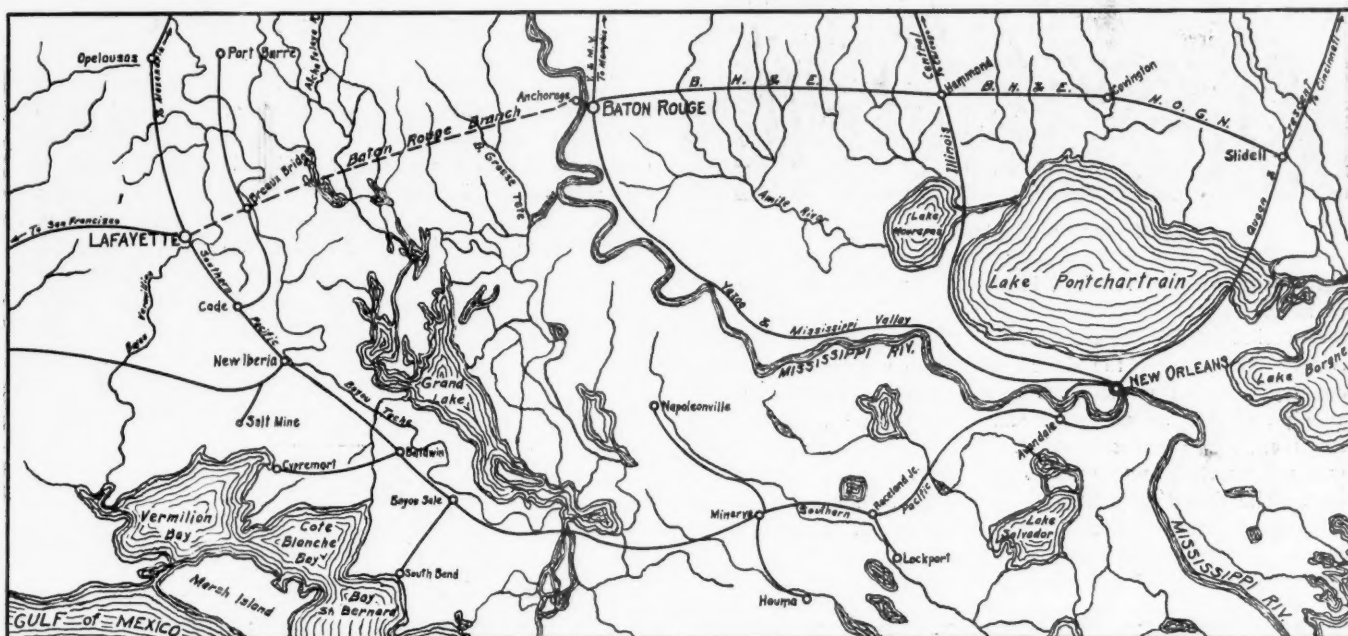
Temporary Trestle, Ready for Dirt Train; Southern Pacific.

time. As the material had to be handled from behind, a pile driver was constructed with the machinery on an elevated deck and with a dolly track passing under this on a lower deck. On this dolly track material cars were operated. This is shown in the photographs. These pile drivers each completed about 100 ft. of trestle per day. In crossing the streams which run through the swamp, permanent trestles and bridges were constructed. All timber used in permanent work was first treated with dead oil of coal tar at the company's works at Houston, Tex.

When the forces met, completing this trestle, earth was hauled in ballast cars from the company's pits, on Bayou Vermillion, an average distance of 15 miles, and dumped into the water until the trestle was entirely filled and the permanent roadbed thus

yards were placed. This method was economical but, as the base could be built only in short periods of low water, and as the number of men who were willing to live and work in the swamp under the trying conditions was limited, too much time would have been required to have used this method in the remainder of the swamp section.

There apparently remained one course, and that was to use the swamp material. To this end a contract was let to the Gulf Dredging Company for the construction of the remaining eight miles by dredge boats. Three dredges were employed on the work. In order to obtain as wide a base, or berme, as possible for the embankment, booms were constructed of extra length: The general cross-section of the work is shown by the accompanying sketch. Where possible to do so all the material was



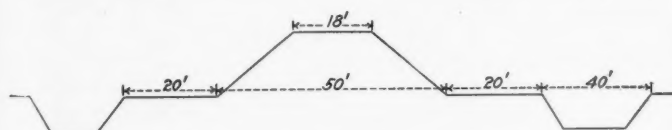
Baton Rouge Cut-Off; Southern Pacific.

formed. The dirt having been unloaded from a height of about 7 ft. into water 6 to 8 ft. deep, the material was thoroughly compacted. It required about 350,000 cubic yards of earth to complete this section. When the waters receded, Bermuda grass was planted on the embankment slopes, and by the time the floods came again, the embankment was in good condition to resist washing. Three years have elapsed and the roadbed is solid and retains its original cross section.

The heavy cost of constructing the temporary trestle caused the engineers to seek other methods of building the remaining roadbed through the swamp. During the progress of the above mentioned work, large forces were placed on the east edge of the swamp, and when the floods subsided the base of the roadbed was built with wheelbarrows. This was carried to a height of

taken from one side. These dredge boats were brought from the vicinity of New Orleans. The engineers, fearing future trouble if the regimen of the Atchafalaya was disturbed, would not permit the banks of that stream (which form the rim of the basin) to be cut, hence the dredge boats had to be brought through the bayous and lakes to the right of way. It was necessary to remove the timber in the bayous by use of dynamite, and for long distances the dredges had to dig channels in which to push their way through the lagoons.

The work of these dredge boats was arduous and slow. It having been impossible in clearing the right of way to cut the trees close to the ground, the dredges encountered large stumps and roots and, though skilfully handled, there were several cases of sinking and partial capsizing. These three dredges, working night and day, were a year in building the roadbed through these eight miles. As the roadbed built by dredges was dressed by hand with pick and shovel and appeared very well, it was hoped that the troublesome part of the construction was over, but such was not the case. Even before track was laid the embankment began to assume irregular shapes through settlement and subsidence. In some sections it gave way laterally from the center; in others it split along lines roughly parallel with the center line, one-half the roadbed retaining its finished grade elevation and the other sinking as much as three or four feet. One of the photographs illustrates this condition. It was first thought that the berme was sloughing into the canals, but investigation disproved this. The irregularities were caused by the subsidence of the original surface and by settlement of the embankment. The track was laid on the unsettled portions of the roadbed, and alinement being adjusted thereto. Although



Cross Section of Roadbed Where Dredge Was Used.

3 to 5 ft. in order to get as much of the work above high water level as possible during the low water period. Track was laid on this incomplete roadbed and earth hauled from pits acquired on the Bayou Grosse Tete ridge and unloaded with plow and cable. The track was raised 12 in. at a lift and this dirt placed under ties and tamped with shovels. This was gradually carried "seaward" from the high ground and three miles of roadbed thus completed. In this section about 125,000 cubic

the track laid from the west joined that from the east on September 1, 1910, nearly five months of steady work with a large force of men, and several trains were required to finally shape up the roadbed and track so as to render operation practicable. About 1,000,000 cubic yards of material were required to build the embankments on the 16 miles through this swamp and the



Settlement of Part of Roadbed.

permanent bridging required is about 1,000 lineal feet per mile of road.

A recital of the facts relating to this construction does not convey any idea of the difficulties that encompassed it. The country afforded no supplies except cat fish. Transportation was practicable by use of steam boats in the rivers and by small craft in the flood period. When the waters subsided it was not practicable to convey any supplies along the right of way. The dense growth of timber, brush and vines prevented free circulation of air, and during the summer months, which, in this latitude, extend from April to November, the temperature combined with the humidity made any sort of exertion unusu-



Dredge Making Fill; Southern Pacific.

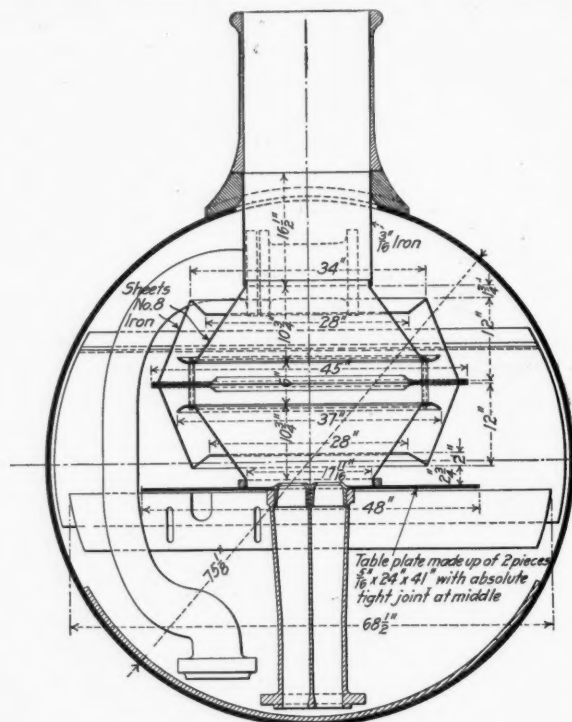
ally tiresome. Mosquitoes and other insects were present in countless numbers and made the most of their unusual opportunity. The absence of communication with the outside world created a condition of isolation and loneliness that was depressing. It was a difficult matter to keep men on the work. The greatest care was necessary to see that the men were provided with pure drinking water and plain, wholesome food, well prepared. Notwithstanding the idea that prevails that alcohol is necessary to kill malaria, the use of intoxicants was discouraged and, as far as possible, prevented. This not only resulted in con-

serving the strength of the men, but it prevented the brawls and discontent which a free use of liquor on such work as this always causes. In spite of their unfavorable surroundings, the general health of the forces was excellent. There was not a death from natural causes on the work during the entire five years of its progress. Two cases of accidental drowning and one of homicide made up the fatalities in the swamp work. It is believed that in very few instances has a work of this magnitude been conducted under similar conditions with less sacrifice of human health and life.

We are indebted for this description and illustrations to Thornwell Fay, vice-president and general manager, Morgan's Louisiana & Texas Railroad. The construction of the line was under the direct charge of E. B. Cushing, Mem. Am. Soc. C. E.

BROOKS SPARK ARRESTER.

The Chicago, Milwaukee & Puget Sound has equipped about 75 locomotives with the Brooks spark arrester, and the results have been such that additional engines are being fitted with the device as fast as opportunity affords. The Pacific and Prairie type locomotives in this territory have large fireboxes of about 50 sq. ft. grate area, with brick arches supported on tubes, and rocker grates in sections 10 in. wide, with air openings 9-16 in.



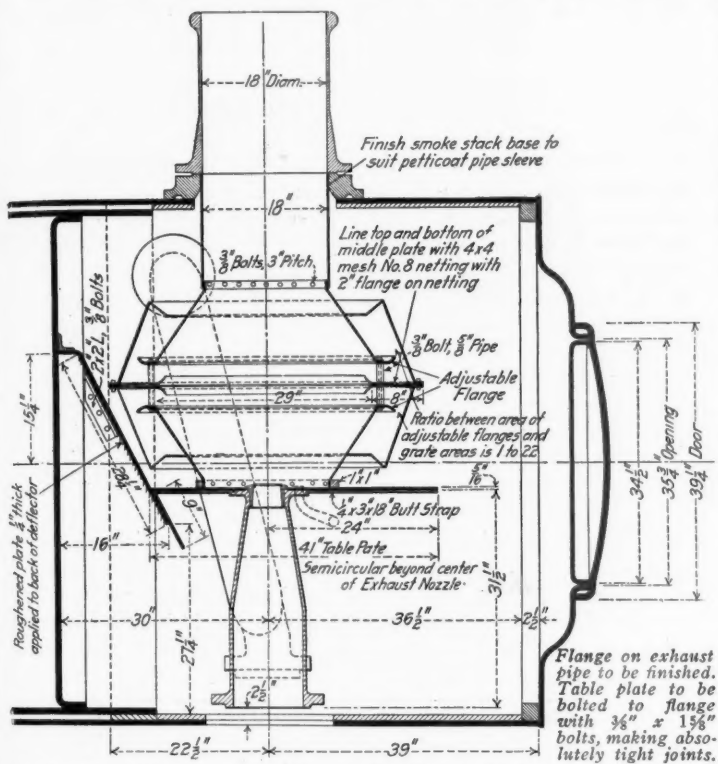
The Brooks Spark Arrester as Applied to Chicago, Milwaukee & Puget Sound Locomotives.

to 11-16 in. wide. The largest boilers have 19-ft. tubes and smoke boxes 78 in. long. The coal used is a semi-lignite obtained from the company's mines at Roundup, Mont., the analysis of which indicates that it is much superior to straight lignite, and compares favorably with the other Western bituminous coals. The chemical composition of the Roundup semi-lignite is: Moisture, 7.83 per cent.; volatile combustible, 32.66; fixed carbon, 53.63; ash, 5.88; sulphur, 0.22. The heat value is 12,771 B. T. U. per pound. In locomotive tests this coal has evaporated 5.6 lbs of water per pound of fuel, and the weight of ash was 7 to 10 per cent.

The Brooks spark arrester can be better understood by an inspection of the drawing than by any description. It appears to be an inverted and concealed diamond stack, with an ingenious array of baffle plates which are arranged to catch the sparks and

allow the gases to escape. The straight stack proper is 18 in. in diameter and 40 in. long with less than one-half of it extending into the smokebox. Two sets of diamond-shaped baffle plates or cones are on the lower end, just above the center line of the smokebox. Between the outer plates is an annular plate 8 in. wide, lined top and bottom with $4 \times 4 \times$ No. 8 netting, which breaks up the sparks. The inner portions of the diamond plates have their edges 3 in. from the central plate, and their outer circumference is fitted with an adjustable curved flange.

The usual baffle plate in front of the tubes has a wide flare and the inner surface is roughened, acting as the initial spark breaker.



The Brooks Spark Arrester as Applied to Chicago, Milwaukee & Puget Sound Locomotives.

There is also a horizontal table plate bolted to the top of the exhaust nozzle which serves to close the lower end of the inner diamond and to deflect the sparks so they will not directly enter the lower opening of the outer diamond. The principle of this spark arrester appears to be a modification of some of the older forms of diamond stack, the deflectors being within the smokebox; while the gases have a circuitous route there is no netting to obstruct their passage.

FOREIGN RAILWAY NOTES.

On December 5, 1910, the first section, 39 miles long, of the Chinese part of the Canton-Kowloon Railway was opened to traffic. It extends to Sin-chuen. The British section of the road, 22 1/2 miles long, was opened to traffic on October 1, 1910.

Russian newspapers tell marvelous tales of the difficulties encountered in building the Amur Railway. It is said that the weather is so severe that earthwork is possible only during less than three months of the year. The valley consists of a mixture of boulders and elastic clay, which at no great depth remains frozen the year round, and must be thawed out artificially to be excavated. Then when it is thawed, it will sustain no considerable weight. Further, for long distances, no water is to be had. It should be remembered that the course of the Amur for hundreds of miles before it reaches the sea is northward, the consequence of which is that its lower course is dammed by ice after the main part of the river is open, which causes great floods.

WORK OF SAFETY COMMITTEES ON THE CHICAGO & NORTH WESTERN.

The *Railway Age Gazette* has already referred (September 2, 1910, page 391) to the movement on the Chicago & North Western to secure effective co-operation between officers and employees to reduce accidents. Employees' safety committees have been organized on all the divisions and in the various shops and division safety committees composed of division officers also have been formed. The employees' committees investigate conditions that may cause accidents and make recommendations to the division safety committees for their removal. There is also a central safety committee, to which the reports and recommendations of the division committees go. R. C. Richards, general claim agent, is its chairman, and the other members are: S. G. Strickland, general superintendent; S. M. Braden, general superintendent; G. W. Dailey, division superintendent; H. T. Bentley, assistant superintendent of motive power; G. B. Shrand, trainmaster Chicago terminals; C. H. Osborn, assistant superintendent car department; W. J. Towne, engineer maintenance of way; H. E. Dickenson, division superintendent; W. E. Dunham, supervisor motive power and machinery, and E. E. Nash. The committees that have now been formed have a total membership, including officers and employees, of about 350.

The method of work followed has been for the division safety committees and employees' safety committee to make inspection trips over the divisions at frequent intervals. They are usually accompanied by Mr. Richards. A special train is provided, and the party, which usually contains 15 to 20 people, ordinarily rides in the superintendent's business car. The members observe the condition of track, structures and equipment as they go along, and make frequent stops for more careful inspection of stations, shops and yards. The committee is often accompanied by division officers not belonging to it; for instance, by road foremen of engines, bridge foremen, etc. Sub-committees are appointed to investigate different matters. For instance, one sub-committee is assigned to inspect track; another roundhouses; another equipment; another to see if operating rules are being disregarded by such conduct as going between moving cars, failure to set cars so as to keep side tracks clear, etc. In the appointment of these sub-committees, on which one or more of the division officers sometimes serve, a point is made of not selecting men to investigate things they are concerned with in their daily work. A track man, for example, is not put on a track committee or a shop man on a shop committee. The track man is put on the shop committee and the shop man on the track committee. The idea is that employees are more apt to notice shortcomings of plants or methods that they do not come in contact with constantly.

An inspection trip over a division takes from one to four days. When it requires more than a day the committee men usually sleep on the car. At the end of the trip a dinner at a hotel is arranged for, at which all sit down together. The sub-committees then make their reports to the full committee, and the matters they bring up are discussed and necessary action taken.

The names of members of the employees' safety committee are posted on the bulletin boards in the roundhouses, shops and other places where the men congregate, and employees are asked to make whatever suggestions and complaints occur to them to the committeemen. The members of the committees wear a special button, which was illustrated in the *Railway Age Gazette* of January 27, page 176.

The central safety committee has recommended that the employees on committees be rotated, the term of office to be not less than six months nor more than 12. At first employees were a little loathe to serve on the committees and hesitated to freely criticize at meetings with their superior officers. The officers, however, have received all suggestions and criticisms in such good spirit that employees are getting ambitious to serve

on the committees, and their members are losing all reluctance about making suggestions and criticisms. It is being found that the employees' committees constitute a very important intermediary between the management and employees in general, because an employee will report matters to a fellow employee on one of the committees that he would not think of reporting directly to an officer.

The work of the safety committees has brought out numerous suggestions for changes in plants and operating methods, which the central committee has recommended to the general officers; and many of the suggestions made have been favorably acted on. The following are some examples: One division committee recommended that side curtains in engine cabs be placed inside the gangway, and experiments are being made to see to what extent this can be done. It has been found that numerous accidents occur in the uncoupling of hose, and it has been recommended that the management consider the advisability of annulling the rule requiring men to go between cars to uncouple air hose on freight cars and in future permit the hose to be uncoupled by the action of the cars in parting. The attention of the central committee was called by several division committees to the inadequate lighting of various roundhouses, engine houses and coal sheds, and the central committee referred the matter to the management, calling particular attention to the conditions at certain places. It was found that at a good many places the poor lighting was due to the fact that the windows had not been kept properly cleaned, and where this was the case immediate action was taken. The inadequate lighting tended to prevent the employees from working as rapidly as they otherwise could and also rendered their work less safe. Some other recommendations that have been received from division committees and favorably acted on by the central safety committee are, that investigation be made to see if it is not practicable to put another hand rail in vestibule cars to make it safer and easier for passengers to get on and off; that instructions be given to employees of the car department to remove to a safer distance drawbars and other things taken from cars; that the motive power department be asked to make arrangements to overcome complaints about blow-off pipes; that action be taken to reduce the number of accidents to trespassers and to bring the matter before the different state legislatures for action; that the general purchasing agent, the general storekeeper and the engineer of tests be requested to investigate thoroughly the quality of oil being purchased and used; that the general managers take some action which will cause private industries to unload their material far enough from tracks to prevent accidents and that certain of the departments of the road be asked to do likewise; that the engineers of maintenance be requested as soon as turntables require re-covering to increase the width of the platforms and cause all planking between the rails on turntables to be removed, and railings to be provided at the sides. Referring to the condition of the tracks and premises of private industries to which employees of the road are obliged to go in the switching cars, one of the division committees recommended that each industry holding a lease be required to build bins for the reception of its materials at least 6½ ft. from the nearest rail, and be not allowed to unload any material, such as coal, sand, gravel, crushed stone, etc., except in such bins. The central safety committee heartily concurred in this recommendation, but suggested that the distance limit for such structures should be 6 ft. Another recommendation from one of the division committees on which the central safety committee acted favorably was that more care be taken in inspecting cedar ties. It was found that a great many have hollow or shaky hearts; that where tie plates are used they are put in the center of ties, and that in spiking the tie to the plate it is found that there is often a shell of but one or two inches of soft timber to hold the spike.

The foregoing are merely examples of recommendations which have come up to the management as a result of its causing the officers and employees to take co-operative action for the pur-

pose of reducing accidents. It has been said very often that a large majority of accidents is due to the carelessness or recklessness of employees. The experience of the North Western shows that a good many such accidents may be prevented by arousing the interest of the employees, and it is highly probable that the management of any other railway which should set on foot a similarly thorough-going investigation—from the employees' standpoint as well as from the management's standpoint—would find at least as many shortcomings of employees and of plant as have been found on the North Western. It would also find probably just as many examples of carelessness about proper lighting of buildings, handling of materials, etc.

It will be noted that most of the recommendations relate to conditions obtaining practically on the entire system. Faulty conditions on a particular division which can be remedied by the co-operation of employees and officers on that division are dealt with by the division committees themselves. Meetings of the division committees as well as of the central safety committee are held every month.

One of the very good results has been to bring officers and employees into closer and more harmonious relations than could possibly exist without such meetings—meetings always having a definite and workable purpose. In fact, practically all the officers and employees in the operating department are being organized into a single body having for its purpose the promotion of safety.

The North Western's management is not missing any chance to remind officers and employees of their duty in respect to the promotion of safety. One of the novel plans that have been adopted on the recommendation of the central safety committee is that of pasting slips regarding the matter of safety on the pay checks of employees and certain officers. The following slips are to be pasted on the checks of assistant superintendents, division engineers, trainmasters, train despatchers, agents, yard masters, roadmasters, conductors, engineers, signal men and foremen of all classes, inspectors of all classes, including engine and car inspectors:

You are responsible for the safety of others as well as yourself.

Exercise of care to prevent accidents is a duty which you owe to yourself and your fellow employees.

The following are to be put on the checks of brakemen, firemen, switchmen, switch tenders, gatemen, flagmen and telegraph operators:

In case of doubt, adopt the safe course. Speed must always give way to safety.

Remember that it is better to cause delay than it is to cause an accident.

The following are to be put on the checks of clerks, helpers and laborers of all classes of stations:

Remember that it takes less time to learn to do
a thing right than it does to explain
why you did it wrong.

The following are to be put on the checks of track men, car and engine repairers and carpenters, and all other employees:

In twelve months 153 men were injured by stepping
on nails projecting from boards and cleats taken
from cars and thrown on the ground close to
the track. Why not pile the boards and
cleats six feet from the rails with
the nails down and save such
injuries? If you don't do
this, you may be the
next victim.

A banner will be given at the end of each six months to the division which during that period has made the best record in keeping down accidents. In conferring the banner consideration will be given to the density of traffic and all other factors that tend to affect to the total number of accidents.

The managing officers believe that already they can see where substantial results have been secured. There has been a marked reduction of personal injuries since the movement was started, as compared with last year. Of course, only when statistics of accidents for a year or more since the safety movement was started can be compared with statistics for a similar previous period can an accurate judgment be formed.

TRAIN ACCIDENTS IN JANUARY.¹

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of January, 1911. This record is intended to include usually only those accidents which result in fatal injury to a passenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the case of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation:

Collisions.					
Date.	Road.	Place.	Cause of Accident.	Kind of train.	Kil'd. Inj'd.
*6.	Atchison, T. & S. F.	Mulvane.	rc.	P. & F.	2 0
†7.	M., Kan. & Tex.	Abbott.	rc.	P. & P.	2 6
13.	N. Y. C.	Batavia.	rc.	P. & P.	6 10
18.	N. Y. C.	Oneida.	xc.	F. & F.	3 0
24.	N. Y. C.	Furness.	bc.	P. & F.	0 2
*25.	Boston & M.	Boston.	xc.	F. & F.	2 0
27.	Grand Trunk	Muskegon.	rc.	F. & F.	1 2

Derailments.					
Date.	Road.	Place.	Cause of derlmt.	Kind of train.	Kil'd. Inj'd.
9.	Del., Lack. & W.	Harrison.	careless running.	F.	1 0
13.	Gt. Northern	Priest River.	exc. speed	F.	2 0
18.	N. Y. C.	Wende.	boiler.	F.	3 0

Other Accidents.					
Date.	Road.	Place.	Cause of Accident.	Kind of train.	Kil'd. Inj'd.
2.	Chic., R. I. & P.	Topeka.	wind.	P.	0 0

In the rear collision of passenger trains at Batavia, N. Y., on the 13th, six passengers were killed and ten or more were injured. Westbound train No. 23, running at 30 or 40 miles an hour, crashed into the rear of train No. 49, which was stand-

ing at the station and the rear car of No. 49, a sleeping car, was completely wrecked. The wreck took fire and some of the victims were severely burned; others were scalded by steam escaping from the boiler of the wrecked locomotive. It is said that train No. 23 had run past four automatic signals set against it. This collision was reported in the *Railway Age Gazette* of January 20.

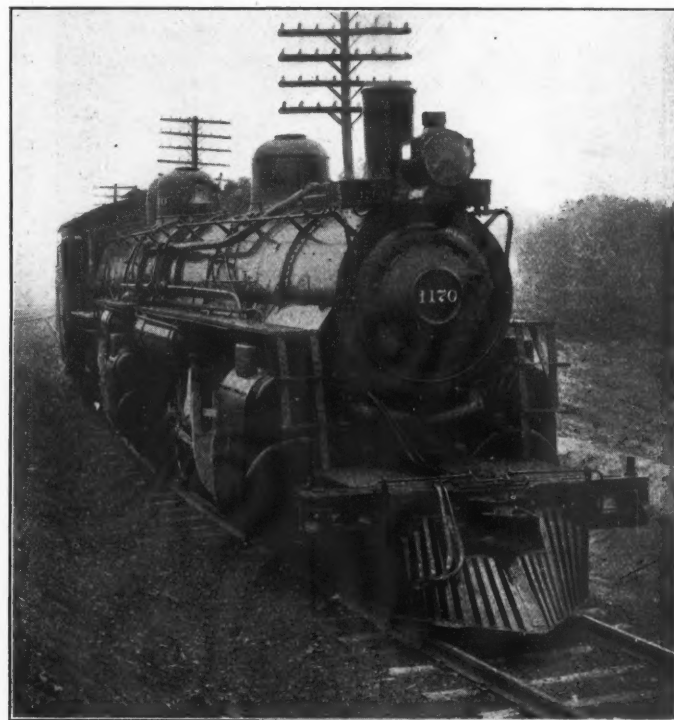
In a collision reported as occurring near Paintsville, Ky., on the night of January 1, six persons riding on the pilot of the locomotive were killed. The road where this occurred is known as the "Millers Creek Railroad," and appears not to be a common carrier. It is operated or controlled by the Consolidation Coal Company. The collision was between a passenger train and three cars which had broken loose from a freight train and were standing on the main track. Four of the killed are classed as passengers and two as trainmen.

Of the electric car accidents reported in the newspapers as occurring in the month of January, we find only one case in which there was a fatal injury. This was a rear collision in Brooklyn, N. Y., on the 2d.

In a rear collision on the Grand Trunk of Canada, at Collins Bay, on the 23d, an engineman and a fireman were killed. A press despatch from South Africa on the 5th reported the derailment of an excursion train near Cathcart, Cape Colony, in which 15 persons were killed and 40 injured.

MALLET LOCOMOTIVES ON THE SANTA FE.

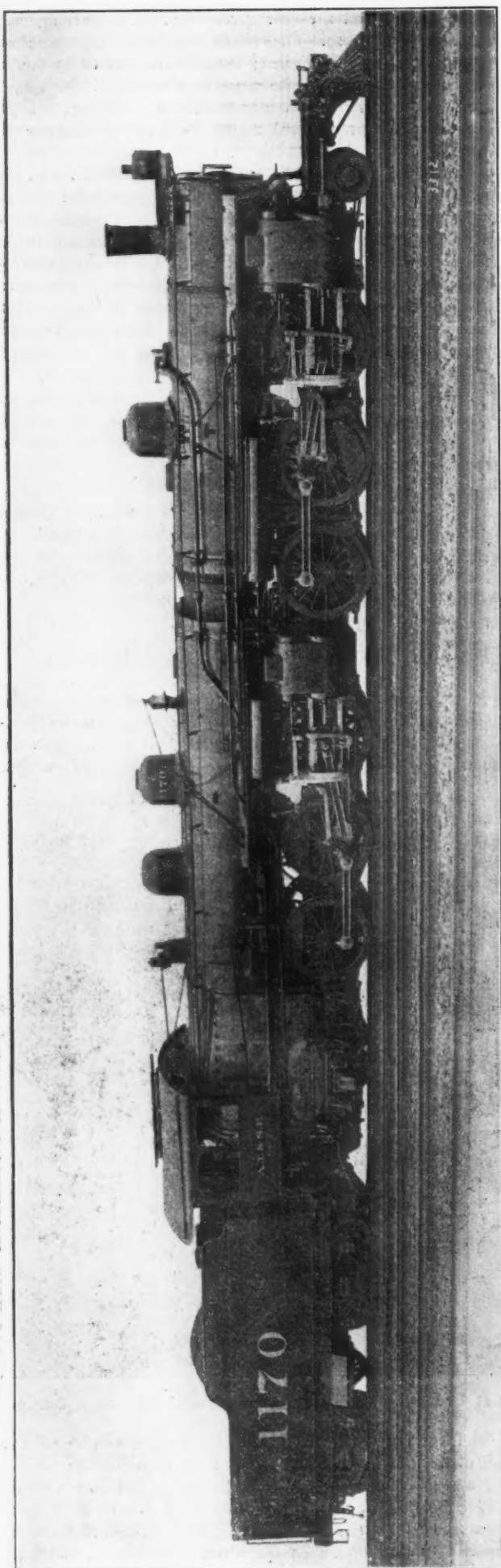
Mallet articulated locomotives were first put in service on the Atchison, Topeka & Santa Fe in the fall of 1909, when the Baldwin Locomotive Works delivered four to that road, which far exceeded in weight and capacity any other locomotives that



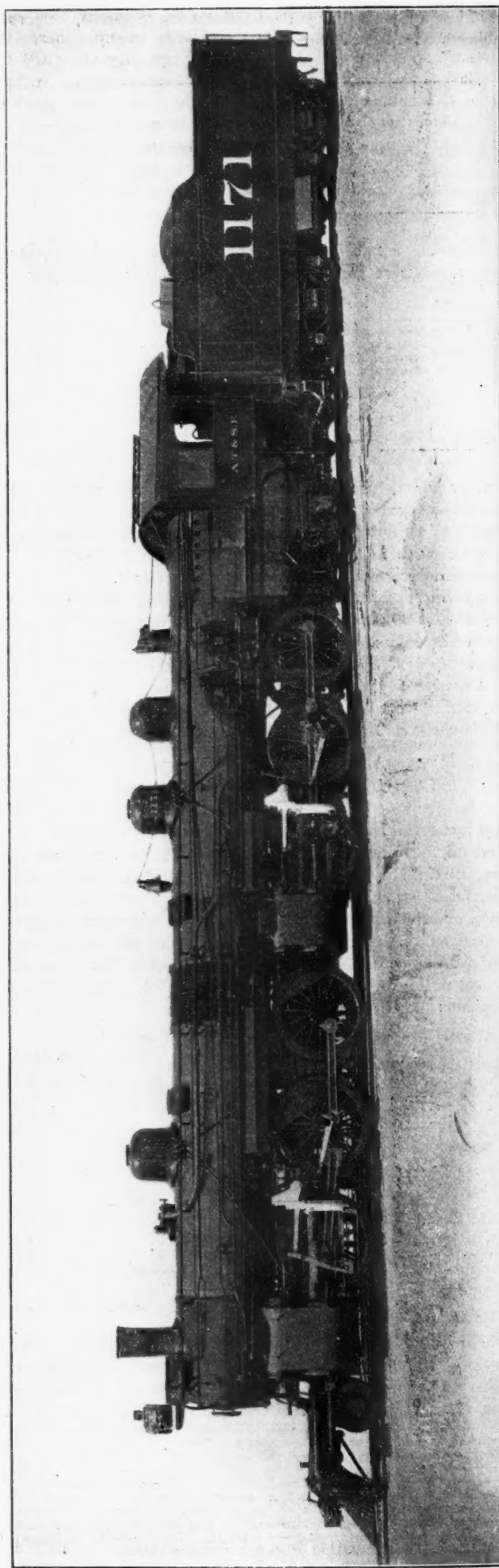
Mallet Locomotive with an Articulated Boiler on a Curve.

were used at that time. Two were for freight service with a 2-8-8-2 wheel arrangement and two for passenger service with a 4-4-6-2 wheel arrangement. Their performance has been watched closely, and a number of improvements have been made in forty Mallets, recently built for the Santa Fe by the Baldwin Locomotive works. These have a 2-6-6-2 wheel arrangement, and their

¹ Abbreviations and marks used in Accident List:
rc, Rear collision—bc, Butting collision—xc, other collision—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc, obstr., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P, or Pass., Passenger train—F, or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

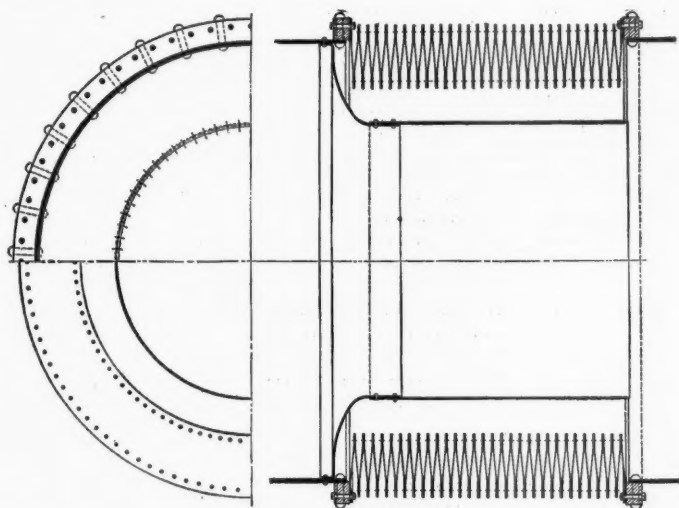


Mallet Locomotive with Double Ball Joint Connection for Articulated Boiler.



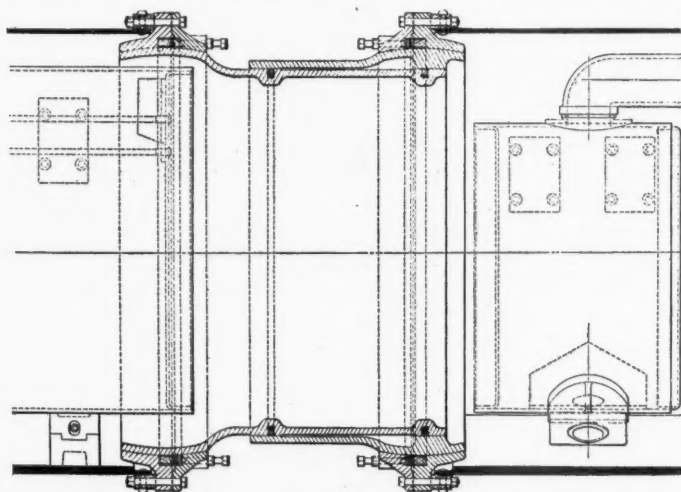
Mallet Locomotive with Bellows Type Connection for Articulated Boiler; Atchison, Topeka & Santa Fe.

general design is based on the Prairie type locomotive for fast freight service. They are used on the Belen cut-off, where the maximum grade is .6 per cent., and although they are rated to haul 2,200 tons, cars and lading, they have actually handled 2,700 tons, maintaining a speed of 15 miles per hour on this grade. Their maximum tractive effort working compound is 61,500 lbs. The special feature in the design of these locomotives is the boilers, two of them being equipped with flexible boilers, while the others have rigid boilers of the separable type.



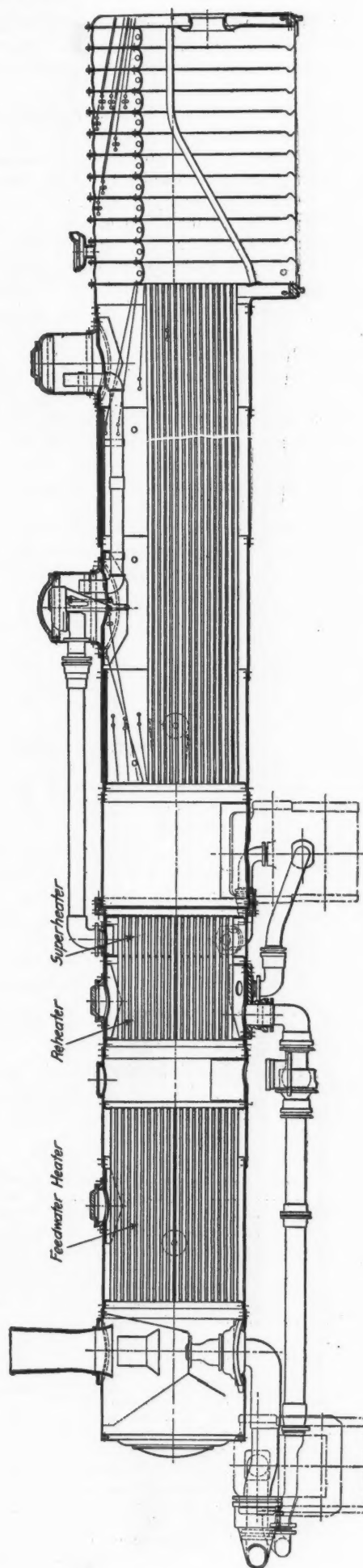
Bellows Type Connection for Articulated Boiler.

The rigid boiler is provided with a separable joint dividing it into two distinct sections. The front section contains the smokebox, feed water heater, combustion chamber, reheater and superheater. The rear, or main boiler section has a combustion chamber in its forward end. The superheater and re-heater are placed adjacent to each other, and are separated by an intermediate tube sheet, and one set of tubes traversing both heaters. The steam piping is so arranged that all joints are placed outside the boiler shell, where they are accessible. Experience on the



Double Ball Joint Connection for Articulated Boiler.

Santa Fe has proved the desirability of drawing the steam for the cylinders from a point as near the firebox as possible, and in order to avoid the use of a long external dry pipe two domes are used on the rear boiler section; these are connected by two internal pipes each 5 in. in diameter. The upper part of the forward dome contains the throttle valve, and is cut off from a direct connection with the boiler by a horizontal plate. The steam on entering the rear dome passes through a netting which assists in catching the suspended water, and is then conveyed through the two 5-in. pipes to the forward dome, where it enters



Rigid Boiler with Separable Joint; Atchison, Topeka & Santa Fe.

the throttle valve, which is so arranged that it only takes steam through the top. The dry pipe leading to the forward section and superheater passes along the top center line of the boiler on the outside.

The two flexible boilers embody decided innovations in locomotive construction in their design. An articulated boiler with a single ball joint, as designed at Topeka, was described in the article by M. H. Haig, mechanical engineer of the Santa Fe, in the *Railway Age Gazette* of February 10, 1911, page 278. In one of the Baldwin designs the principle is somewhat the same, except that there are two ball joints, one on each section of the boiler, with long overlapping sleeves and packing rings near the edge. A detail of this design is here illustrated. The ball joints are kept tight by rings of soft metallic packing, which may be adjusted by set screws. The two boiler sections may thus move in any direction relative to one another, full provision being made for expansion and contraction. The other flexible joint shown is that designed by Mr. Vauclain, of the Baldwin Locomotive Works, and is called the Bellows type connection. This joint consists of 60 rings, of high carbon steel, No. 14 gage thick, 10 in. wide and 75½ in. outside diameter. They are made with a set, so that when placed adjacent to each other they form a series of V-shaped joints. The adjacent rings are riveted together at the inside and bolted at the outside; the whole flexible connection is bolted in place between the front and rear sections. The products of combustion traverse this connection through a cylindrical flue 44 in. in diameter, which is riveted to the rear boiler section and prevents cinders from lodging in the crevices between the connecting rings.

It is, of course, necessary in these engines with flexible boilers to place flexible joints in all pipes which pass the articulated connection in the boiler. This, however, introduces no important complication. The steam piping is simplified, as no flexible joints are required in the exhaust connection between the low pressure cylinder and the smokebox. There is also a distinct advantage in the avoidance of sliding supports under the forward boiler section, and the stability of the locomotive on curves is not impaired by the lateral displacement of the boiler on the front frames, which necessarily occurs in a Mallet locomotive as usually built. Both the high and low pressure pistons are packed with cast iron rings sprung in. The high pressure piston head, 24 in. in diameter, is made of cast iron in one piece. The body of the low pressure piston is made of cast steel, and a cast iron bearing ring measuring 8 in. in width at the bottom is bolted to it. Tire flange oilers are applied to the leading driving wheels of the front group, which should prove of value in reducing flange wear, as the road has curves of 16 deg. on sidings and 10 deg. on the main line.

Record No. 69, recently issued by the Baldwin Locomotive Works, and from which this article was compiled, gives a more detailed account of the locomotives. Following are the principal dimensions and ratios:

General Data.	
Type	Mallet
Service	Freight
Fuel	Soft coal
Tractive effort	61,500 lbs.
Weight in working order.....	392,300 lbs.
Weight on drivers.....	317,300 lbs.
Weight of engine and tender in working order.....	562,000 lbs.
Wheel base, driving	37 ft. 10 in.
Wheel base, rigid	13 ft. 8 in.
Wheel base, total	56 ft. 5 in.
Wheel base, engine and tender.....	89 ft. 3 in.
Ratios.	
Total weight ÷ tractive effort.....	6.38
Weight on drivers ÷ tractive effort.....	5.15
Tractive effort × diam. drivers ÷ total heating surface†.....	771
Tractive effort × diam. drivers ÷ total equivalent heating surface*	657
Total heating surface† ÷ grate area.....	105
Total equivalent heating surface* ÷ grate area.....	123
Firebox heating surface ÷ total heating surface,† per cent.....	3.64
Firebox heating surface ÷ total equivalent heating surface,* per cent.....	3.10

Ratios.	
Weight on drivers ÷ total heating surface†.....	57.6
Weight on drivers ÷ total equivalent heating surface*..	49.1
Total weight ÷ total heating surface†.....	71.3
Total weight ÷ total equivalent heating surface*.....	60.8
Volume equivalent simple cylinders, cu. ft.....	20.60
Total heating surface† ÷ vol. cylinders.....	267.5
Total equivalent heating surface* ÷ vol. cylinders.....	313.5
Grate area ÷ vol. cylinders.....	2.55
Cylinders.	
Kind	Compound
Diameter	24 in. and 38 in.
Stroke	28 in.
Valves.	
Kind	Bal. piston
Wheels.	
Driving, diameter over tire.....	69 in.
Driving, thickness of tire.....	3½ in.
Driving, journals, main, diameter.....	10 in. x 12 in.
Driving, journals, others, diameter.....	9 in. x 12 in.
Engine truck, diameter.....	31¼ in.
Engine truck, journals.....	6½ in. x 12 in.
Trailing truck, diameter	40 in.
Trailing truck, journals.....	8 in. x 14 in.
Boiler.	
Style	Straight
Working pressure	220 lbs.
Outside diameter of first ring.....	70 in.
Firebox, width and length.....	63¼ in. x 119½ in.
Firebox, plates, thickness.....	{ 5/16 in., ¾ in., and 9/16 in.
Firebox, water space.....	5 in. and 5½ in.
Tubes, number and diameter.....	294—2¼ in.
Tubes, length	19 ft. 7 in.
Heating surface, tubes	3,376 sq. ft.
Heating surface, firebox	200 sq. ft.
Heating surface, firebrick tubes.....	34 sq. ft.
Heating surface, feed-water heater	1,893 sq. ft.
Heating surface, total, including feed-water heater.....	5,503 sq. ft.
Heating surface, reheater	650 sq. ft.
Heating surface, superheater.....	300 sq. ft.
Heating surface, total equivalent.....	6,453 sq. ft.
Grate area	52.5 sq. ft.
Tender.	
Tank, style	Water bottom
Wheels, diameter	34¼ in.
Journals	5½ in. x 10 in.
Water capacity	9,000 gals.
Coal capacity	12 tons

†Total heating surface includes feed-water heating surface.

*Total equivalent heating surface equals total heating surface plus reheating and superheating surface.

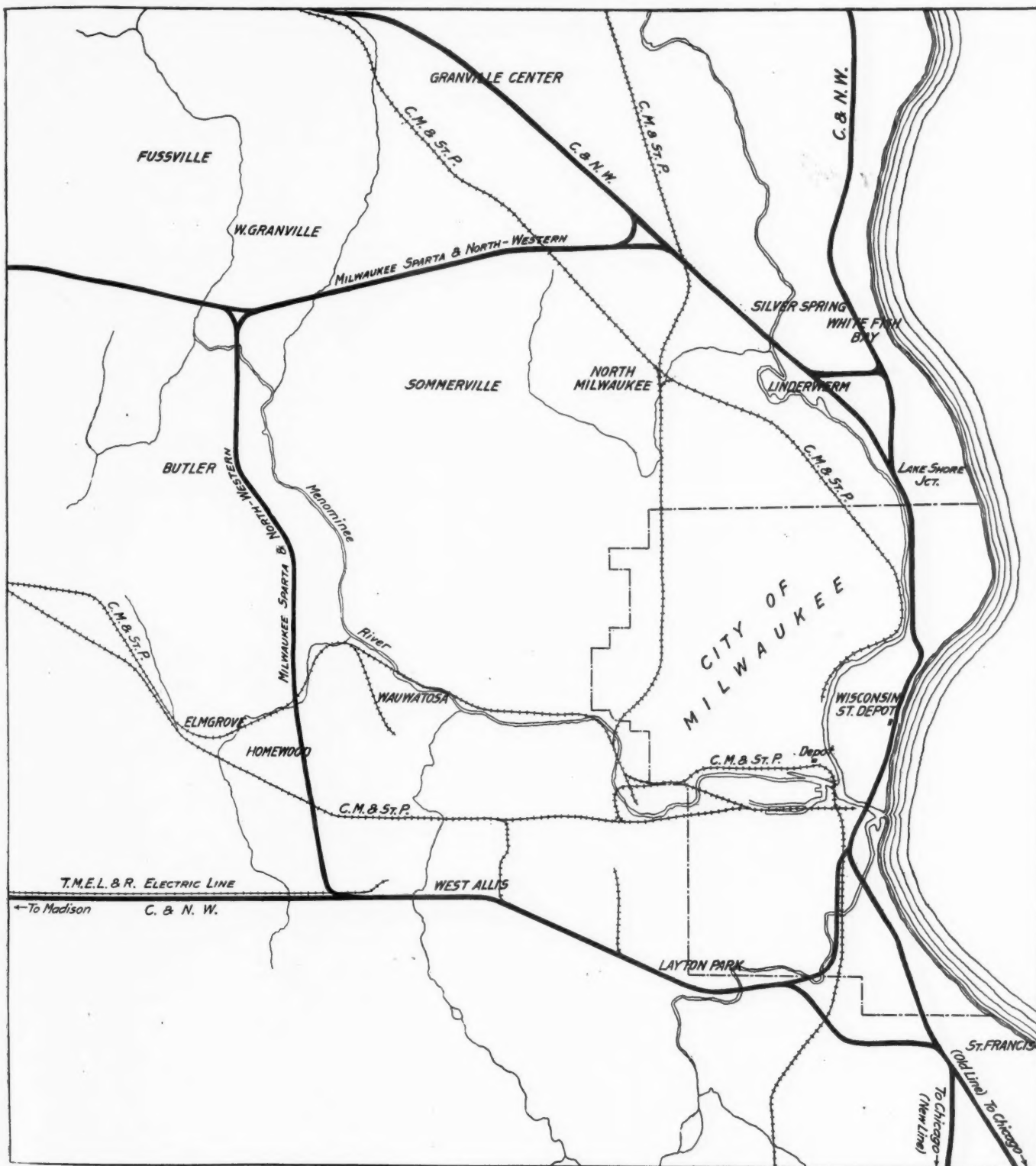
BELT LINES OF THE CHICAGO & NORTH WESTERN AT CHICAGO AND MILWAUKEE.

There has been much discussion by railway officers in recent years of the need for belt lines outside of the congested parts of large cities, over which through traffic originating at and destined to points other than these large cities themselves could be routed. The Chicago & North Western is one road whose management has not only been talking about this needed improvement, but has been making it. The North Western has been building outer belt lines at both Chicago and Milwaukee.

Its Des Plaines Valley Railway intersects, above Northfield, Ill., the two double track lines of the North Western running from Chicago to Milwaukee. From Northfield, as shown by one of the accompanying maps, it runs southwest to Des Plaines, Ill., where it intersects the Wisconsin division of the North Western. Southwest of Des Plaines it turns directly south and runs to a connection with the Galena division at Proviso, Ill. The line is 12 miles from the congested part of Chicago and is 22 miles long. At Proviso the yards have been enlarged, large engine houses have been built, cooling plants have been erected, etc. At this point the Des Plaines Valley connects with the Indiana Harbor Belt, and here the switching of through cars in connection with the making up of trains will be done, which heretofore has been done in the city. This will give the North

Western an opportunity to exchange with other roads via the Indiana Harbor line, in addition to using the facilities now afforded by the Belt Railway, and with the constant increase in business it will probably mean additional traffic for both the belt lines mentioned; and will also result satisfactorily from the standpoint of time required to effect transfers. Besides expe-

struction of the Des Plaines Valley Railway will give the North Western for handling freight traffic at Chicago, a further enlargement of facilities will result from the construction of its new passenger terminals in that city and the use of the tracks now employed in passenger service for the handling of freight business.

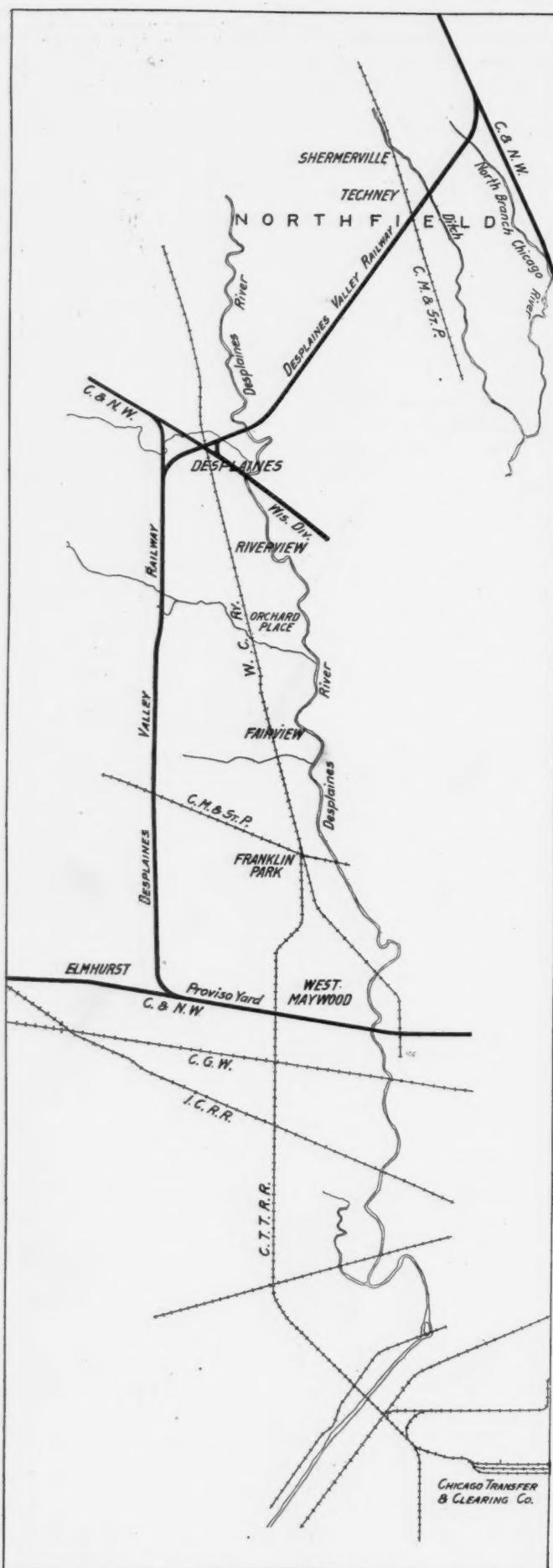


Chicago & North Western Lines Around Milwaukee.

ditioning the handling of existing traffic, the new line will open up an extensive territory where facilities can be provided for the location of new industries which will afford additional traffic.

In addition to the large terminal facilities which the con-

The other map herewith shows both the old lines of the Chicago & North Western through Milwaukee and its new belt line, the Milwaukee, Sparta & Northwestern. Formerly through traffic was routed through the city from Lake Shore Junction as far around as West Allis, all the business, both local and



Des Plaines Valley Line of the Chicago & North Western.

through, passing through a narrow throat in the city along the lake front. Now all business originating at and destined to points beyond Milwaukee will be moved via the Milwaukee, Sparta & Northwestern, which will eliminate the congestion incidental to the mixture of local and through traffic and make it practicable both to better serve the industries already located on the North Western and to open up a large territory suitable to industrial development.

The Milwaukee, Sparta & Northwestern is a new low grade line from Lindworm, Wis., about eight miles north of Milwaukee, to Sparta, Wis., a distance of about 169 miles, exclusive of the belt connections around Milwaukee shown on the map. The new line connects with the Chicago, St. Paul, Minneapolis & Omaha at Wyeville, and gives the North Western an opportunity to handle its heavy tonnage for the Twin Cities and Duluth, and connecting traffic for the Omaha line over a direct low grade road, which will enable engines to pull larger units without sacrificing time. This line, in connection with the Milwaukee belt, will also provide the North Western with means to run some of its through passenger trains to Duluth and the Twin Cities through Milwaukee. It now has direct connections from Milwaukee to Lake Superior and Minnesota by its Waukesha and Madison lines, but the new road will be more direct.

The construction of these belt lines is in line with the policy which Marvin Hughitt, chairman of the Chicago & North Western, has pursued of developing home industries.

THE GENEALOGY OF THE NEW HAVEN.

[WITH AN INSET.]

The New York & New Haven Railroad, the base on which the New York, New Haven & Hartford system was built up, was chartered in 1844, but not fully opened until five years later, after much difficulty in raising its original capital of \$2,500,000. The basic line from New Haven to a junction with the Harlem tracks was then, as now, about 64 miles. Its beginnings, of course, were meager. There were no night trains on the line and but two freight trains per day; yet it paid dividends almost from the first from earnings that then had better been used in improvements. Ere long it suffered two costly calamities. One was the famous "Schuyler fraud"—the issue of spurious shares for nearly \$2,000,000 by Robert Schuyler, president and stock transfer agent of the corporation. The story of that dramatic crime with its rich harvest of litigation and which the company did not outlive for 14 years will be found on page 317 of the *Railroad Gazette* of April 29, 1904. The other calamity was the Norwalk drawbridge disaster, May 6, 1853, in which 46 persons lost their lives.

It is a striking fact that the present system has been built up during two decades and under two presidents—C. P. Clark and C. S. Mellen—the earlier history of the road being ultra-conservative. Not until 1872, or 23 years after its opening, did it take in the New Haven, Hartford & Springfield line, the natural extension into Massachusetts. The important acquisition under intermediate presidents, G. W. Watrous and J. M. Hall, who for a brief time succeeded President Clark, were the New Haven & Northampton; the old Shore Line between New Haven and New London; and the more important New York & New England, reaching from the Hudson river to Boston—a line of checkered and sensational history. But under President Clark consolidation went on by leaps and bounds. It included the Housatonic group; the Naugatuck; the Boston Air Line; the large Old Colony and the New York, Providence & Boston, with their several allied Sound boat lines; the beginnings of trolley purchase; and along with these the development of the Harlem terminal and the four-tracking of the main line between New Haven and New York.

Big and swift as were President Clark's mergers he has been surpassed in the development of the system by his successor.



THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD COMPANY.

CONSTITUENT AND LEASED PROPERTIES OPERATED DIRECTLY.
COMPANIES CONSOLIDATED.

COMPANIES CONSOLIDATED.	Date
Name of Company.	Consolidated.
THE NEW YORK & NEW HAVEN R. R. CO. }	Aug. 6, 1872
THE HARTFORD & NEW HAVEN R. R. CO. }	
The latter has been consolidated with	
The Hartford & Springfield R. R.	in 1847.
The Branch Co.	" 1850.
The Middletown R. R. Co.	" 1850.
Middletown Extension R. R. Co.	" 1861.
New Britain & Middletown R. R. Co.	" 1868.
Windsor Locks & Suffield R. R. Co.	" 1871.
THE STAMFORD & NEW CANAAN R. R. CO.	Oct. 1, 1890
Successor of	
New Canaan R. R. Co.	
THE HARTFORD & CONNECTICUT VALLEY R. R. CO.	Dec. 21, 1892
Successor to	
Connecticut Valley R. R. Co.	
NEW YORK, PROVIDENCE & BOSTON R. R. CO.	Feb. 13, 1893
THE COMPANY FOR ERECTING AND SUPPORTING A TOLL	
BRIDGE FROM NEW HAVEN TO EAST HAVEN.	Oct. 18, 1895
THE UNION WHARF CO. IN NEW HAVEN AND THE CON-	
TRACTORS TO REBUILD AND SUPPORT UNION WHARF	
AND PIER IN NEW HAVEN.	Oct. 18, 1895
SHORE LINE RAILWAY CO.	Mar. 18, 1897
Successor in 1864 to	
The New Haven, New London & Stonington R. R. Co.,	
which was formed in 1856 by a merger of	
New Haven & New London R. R. Co. with	
New London & Stonington R. R. Co.	
THE HOUSATONIC R. R. CO.	Mar. 28, 1898
SHEPAUG, LITCHFIELD & NORTHERN R. R. CO.	July 9, 1898
Successor of	
Shepaug Valley R. R. Co. and	
Shepaug R. R. Co.	
DANBURY & NORWALK R. R. CO.	Oct. 26, 1905
PROVIDENCE & SPRINGFIELD R. R. CO.	Oct. 30, 1905
Successor in 1872 to	
Woonasquatucket R. R. Co.	
NEW HAVEN & DERBY R. R. CO.	Nov. 3, 1905
RHODE ISLAND & MASS. R. R. CO. (R. I. Div.)	Nov. 3, 1905
Incorporated under name of	
Rhode Island Mining R. R. Co.	
WOONSOCKET & PASCOAG R. R. CO.	Nov. 3, 1905
THE MIDDLETOWN, MERIDEN & WATERBURY R. R. CO.	Nov. 3, 1905
Formerly	
The Meriden & Cromwell R. R. Co. and	
The Meriden & Waterbury R. R. Co.	
Consolidated in 1887 under the name of	
The Meriden, Waterbury & Conn. River R. R. Co.	
Sold under foreclosure and came into the	
possession of the M. M. & W. R. R. Co. in 1898.	
THE ROCKVILLE R. R. CO.	Nov. 6, 1905
COLCHESTER RY. CO.	Dec. 16, 1905
THE NAUGATUCK R. R. CO.	Jan. 31, 1906
Purchased under foreclosure	
The Watertown & Waterbury R. R. Co. in 1893.	
THE PROVIDENCE TERMINAL CO.	Dec. 29, 1906
Incorporated as	
New York, Providence & Boston & Old Colony	
R. R. Terminal Co.	
BOSTON & NEW YORK AIR LINE R. R. CO.	Jan. 30, 1907
Successor of	
New Haven, Middletown & Willimantic R. R. Co.	
PAWTUCKET VALLEY R. R. CO.	Feb. 5, 1907
THE MANUFACTURERS R. R. CO.	Apr. 30, 1907
Successor to	
The Manufacturers St. Ry. Co. of New Haven.	
THE NEW ENGLAND R. R. CO.	Apr. 1, 1908
Successor in 1895 to the	
New York & New England R. R. Co.	

NOTE.—On May 31, 1907, The Consolidated Ry. Co., organized Aug. 31, 1901, and The New York, New Haven & Hartford R. R. Co., merged under the name The New York, New Haven & Hartford R. R. Co.

PROPERTIES LEASED.

Name of Company.	Terms of Lease.	Stock owned by N.Y.N.H.&H.	% Owed
*Berkshire R. R. Co.....	99 yrs. from Apr. 1, 1893..	\$856,100.00	79.3
Boston & Providence R. R. Corp..	99 yrs. from Apr. 1, 1888..	217,800.00	5.4
The Harlem River & Port Chester R. R. Co.....	99 yrs. from Oct. 1, 1873..	1,000,000.00	100
Holyoke & Westfield R. R. Co.....	†Perpetual from June 1, 1907	20,000.00	7.7
*Milford, Franklin & Providence R. R. Co.....	Expired Apr. 1, 1907.....	100,000.00	100
‡Milford & Woonsocket R. R. Co...	Expired Apr. 1, 1907.....	148,600.00	100
*New Haven & Northampton Co...	99 yrs. from Apr. 1, 1887..	2,460,000.00	100
Norwich & Worcester R. R. Co.....	100 yrs. from Feb. 1, 1869.	69,200.00	2.3
Old Colony R. R. Co.....	99 yrs. from Mar. 1, 1893..	7,749,400.00	38
Providence, Warren & Bristol R. R. Co.	95 yrs. 9 mos. from July 1, 1891	500.00	0.3
Providence & Worcester R. R.....	99 yrs. from July 1, 1892..	311,800.00	8.9
*Rhode Island & Mass. R. R. (in Mass.)	Operated without lease....	100,000.00	100
Plymouth & Middleboro R. R. Co..	99 yrs. from Dec. 1, 1892..	.....	...
Chatham R. R. Co.....	To June 30, 1910, and there- after until terminated by either party by 10 days' written notice .....	.....	.....

* Merged in October, 1910.

‡ Merger proposed this year.

† In perpetuity to New Haven & Northampton Co.

DIRECT CAPITAL OBLIGATION

Name.	Rate %	Character.	Date Maturity.
Capital stock (par \$100).....	..	.....	.....
Outstanding receipts for installments paid on subscriptions to 446,449 shares....	..	.....	.....
BONDS.			
N. Y. N. H. & H. R. R. Co., H. R. & P. C.	4	1st mtg.	May 1, 1915
N. Y., Prov. & Boston R. R. Co.....	4	Genl. mtg.	Apr. 1, 1914
Housatonic R. R. Co.....	5	Consol. mtg.	Nov. 1, 1913
Danbury & Norwalk R. R. Co.....	6	Consol. mtg.	July 1, 1912
" " ".....	5	Consol. mtg.	July 1, 1912
" " ".....	5	Genl. mtg.	Apr. 1, 1912
" " ".....	4	1st ref. mtg.	June 1, 1915
Woonsocket & Pascoag R. R. Co.....	5	1st mtg.	Oct. 1, 1911
New Haven & Derby R. R. Co.....	5	Consol. mtg.	May 1, 1911
Providence & Springfield R. R. Co.....	5	1st mtg.	July 1, 1912
Naugatuck R. R. Co.....	4	1st mtg.	May 1, 1915
Boston & N. Y. Air Line R. R. Co.....	4	1st mtg.	Aug. 1, 1915
Providence Terminal Co.	4	1st mtg.	Mar. 1, 1915
Pawtuxet Valley R. R. Co.....	4	1st mtg.	Apr. 1, 1912
New England R. R. Co.....	4	Consol. mtg.	July 1, 1914
" " ".....	5	Consol. mtg.	July 1, 1914
Roxbury Central Wharf	5	1st mtg. gold notes.	Sept. 1, 1911
Worcester & Conn. Eastern Ry. Co....	4½	1st mtg.	Jan. 1, 1914
Winchester Ave. R. R. Co.....	5	1st mtg.	Nov. 1, 1911
New Haven St. Ry. Co.....	5	1st mtg.	Sept. 1, 1911
" " ".....	5	Consol. mtg.	June 1, 1911
New Haven & Centreville St. Ry. Co...	5	1st mtg.	Sept. 1, 1913
Meriden Horse R. R. Co.....	5	1st mtg.	Oct. 1, 1911
" " ".....	5	Consol. mtg.	Jan. 1, 1912
Norwich St. Ry. Co.....	5	1st mtg.	Oct. 2, 1912
Montville St. Ry. Co.....	5	1st mtg.	May 1, 1912
New London St. Ry. Co.....	5	1st mtg.	Oct. 2, 1912
Middletown Horse R. R. Co.....	5	1st mtg.	Dec. 1, 1911
Portland St. Ry. Co.....	5	1st mtg.	Nov. 1, 1911
Hartford, Manchester & Rockville Tram- way Co.	5	1st mtg.	Oct. 1, 1912
Hartford St. Ry. Co.....	4	1st mtg.	Sept. 1, 1913
Greenwich Tramway Co.	5	1st mtg.	July 1, 1913
Branford Electric Co.	5	1st mtg.	Oct. 1, 1913
Branford Light & Water Co.....	5	1st conl. mtg.	Aug. 1, 1915
Torrington & Winchester St. Ry. Co....	5	1st mtg.	Dec. 1, 1911
Meriden, Southington & Compounce Tram- way Co.	5	1st mtg.	July 1, 1912
Stafford Springs St. Ry. Co.....	5	1st mtg.	July 1, 1915
Total			

DERENTURES

DEBENTURES.		
New York, New Haven & Hartford R. R. Co.	6	Convertible.
" " " "	3½	Convertible.
" " " "	4	Non-convert.
" " " "	4	Non-convert.
" " " "	3½	Non-convert.
" " " "	3½	Non-convert.
" " " "	4	Non-convert.
" " " "	4	Non-convert.
" " " "	4½	3-yr. deb. notes.
" " " "	5	4-yr. deb. notes.
" " " "	5	5-yr. deb. notes.
" " " "	5	5-yr. deb. notes.
European loan of 1907.....	4	.....
Naugatuck R. R. Co.....	3½	Debentures.
Hartford St. Ry. Co.....	4	Deb. Series M.
The Consolidated Ry. Co.....	3.3½ & 4	Debentures.
" " " ".....	4	1954 Deb.
" " " ".....	4	1955 Deb.
" " " ".....	4	1955 Deb.
" " " ".....	4	1956 Deb.
The Farmington St. Ry. Co.....	5	Debentures.
Total .....	..	.....
Real estate mortgage.....	..	.....
Advance payments 3d and 4th installments of subscriptions to capital stock.....	4	.....

NOTES PAYABLE.

\$5,280,364.28	4	}
500,000.00	4½			

CONTINGENT LIABILITIES.

Boston Terminal Co. Bonds, \$14,000,000.00 on June 30, 1910.
Jointly liable with other roads for any deficiency on foreclosure.
Springfield Railway Companies' Preferred Stock.
Guarantees 4% dividends on \$3,387,950.00 and payment of principal
New England Investment & Security Co. Preferred Stock and 15-year
Guarantees 4% dividends on \$4,000,000.00 and payment of principal at
Guarantees payment of principal, \$3,000,000.00, and interest of 15-year
Guarantees payment of an additional \$13,250,000.00 and interest of same
Billard as per contract.
Providence Securities Co. 4% 50-year Gold Debentures, \$19,899,000.00, dated 1910
Guarantor by endorsement.
New England Navigation Co. Gold Debentures, \$3,600,000.00.
Guarantees payment of principal and interest in case of termination of
New Haven & Northampton Co. 4% 50-year Refunding Gold Bonds dated June 1, 1910
Guarantor by endorsement to the amount of \$2,400,000.*
New York & Stamford Ry. Co. 4% 50-year 1st and Refunding Gold Bonds
Guarantees payment of principal and interest to the amount of \$274,000
The Harlem River & Port Chester R. R. Co. 4% 30-year 2d Mortgage Bonds
Guarantees payment of principal (\$1,000,000.00) and interest.
The principal and interest to maturity has been deposited by the N. Y. N. H. & H. R. R. Co.
Loan and Trust Co., trustee.
Boston Railroad Holding Co. stock, bonds, notes and other evidences of indebtedness
Under the provisions of Section 4, Chapter 519 of Acts of the General Court of the Commonwealth of Massachusetts, passed at its 1909 session, the N. Y. N. H. & H. R. R. Co. is authorized to issue
the principal of, and the dividends, and interest upon the capital stock of, the
indebtedness of Boston Railroad Holding Co. held by it.

*In addition, the New Haven & Northampton Company has outstanding of which \$54,000 are held in the New Haven Accident & Casualty Fund.

GATIONS.			
Date	Total	In N.Y.N.H.&H.	Owned by
aturity.	Out-standing.	Treasury, or in	Subsidiary
.....	\$121,878,100.00	Reserve Funds.	Companies.
.....	\$22,139,325.00	\$123,625.00	\$17,442,500.00
y 1, 1954	\$15,000,000.00		
y 1, 1942	1,000,000.00	\$201,000.00	
y 1, 1937	2,839,000.00		
y 1, 1920	100,000.00		
y 1, 1920	400,000.00		
y 1, 1925	150,000.00		
e 1, 1955	350,000.00		
y 1, 1910	100,000.00		
y 1, 1918	575,000.00	1,000.00	
y 1, 1922	750,000.00		
y 1, 1954	2,500,000.00	1,000.00	
y 1, 1955	3,777,000.00		
y 1, 1956	4,000,000.00		
y 1, 1925	160,000.00		
y 1, 1945	10,000,000.00		
y 1, 1945	7,500,000.00		
t. 1, 1912	290,000.00		
y 1, 1943	1,992,000.00	38,000.00	\$40,000.00
y 1, 1912	500,000.00		
t. 1, 1913	600,000.00		
e 1, 1914	250,000.00		
t. 1, 1933	283,000.00		
y 1, 1911	85,000.00		
y 1, 1924	415,000.00		
y 2, 1923	350,000.00		
y 1, 1920	250,000.00		
y 2, 1923	150,000.00		
t. 1, 1914	150,000.00		
y 1, 1916	30,000.00		
y 1, 1924	200,000.00		
t. 1, 1930	2,500,000.00		
y 1, 1931	320,000.00		
y 1, 1937	63,000.00		
y 1, 1951	307,000.00		
y 1, 1917	150,000.00		
y 1, 1928	175,000.00		
y 1, 1956	400,000.00		
.....	\$58,661,000.00	\$241,000.00	\$40,000.00
15, 1948	\$39,029,000.00	\$600,800.00	
y 1, 1956	30,000,000.00	589,100.00	\$50,000.00
y 1, 1914	5,000,000.00	45,000.00	
y 1, 1947	5,000,000.00		
y 1, 1947	5,000,000.00	9,000.00	
y 1, 1954	10,000,000.00	2,100.00	
y 1, 1955	15,000,000.00		
y 1, 1956	15,000,000.00		
y 5, 1911	2,000,000.00		
y 9, 1911	1,350,000.00	55,000.00	
y 1, 1912	300,000.00	50,000.00	
y 9, 1912	6,400,000.00	30,000.00	
y 1, 1922	27,985,000.00		
y 1, 1930	234,000.00		
y 1, 1930	165,000.00		
y 1, 1930	972,000.00	700.00	
y 1, 1954	4,255,000.00		
y 1, 1955	2,309,000.00		
y 1, 1955	1,340,000.00		
y 1, 1956	2,011,000.00		
y 1, 1924	30,000.00		
.....	\$173,380,000.00	\$1,381,700.00	\$50,000.00
.....	\$11,500.00		
.....	\$7,067,062.50	\$153,750.00	\$3,555,812.50
.....	\$5,780,364.28	.....	\$4,180,364.28

ITIES.

ure.

ciy 1954 on liquidation.

ear Funding Gold Notes.

ipal at 105% on liquidation.

15-year funding gold notes dated April 1, 1909.

st of same notes when requested to do so by John L.

, dated May 1, 1907.

ation of Old Colony R. R. Co. lease.

dated June 1, 1906.

l Bonds dated Nov. 1, 1908.

\$274,000.00.

ge Bonds, dated June 1, 1881.

the N. Y. N. H. & H R. R. Co. with the Farmers'

es of indebtedness.

he General Court of the Commonwealth of Massa-

R. R. promises when they shall be sold to guarantee

capital stock, bonds, notes and other evidences of

standing \$700,000.00 of 5% Northern Extension bonds,

Fund.

BOSTON RAILROAD HOLDING CO.		
Outstanding.		
	Total.	Owned by N.Y.N.H.&H.
Capital stock (Par \$100)	\$3,106,500.00	\$3,106,500.00
Debentures, 4%, due Nov. 1, 1959..	20,012,000.00	20,012,000.00
This company owns:		
6,543 shares Boston & Maine pref. stock out of 31,498 shares;		
153,571 shares Boston & Maine com. stock out of 288,413 shares;		
and \$390.70 common scrip.		

CENTRAL NEW	
Preferred stock (Par \$100).....	
Common stock (Par \$100).....	
Bonds:	
Central New Eng. 1st mtg. 5%, due 1942	
Poughkeepsie & Eastern Ry. 1st mtg. 5%	
Dutchess County R. R. Co. 1st mtg. 4%	
Central New Eng. gen. mtg. inc., due 1942	
Maximum rate 5%, beginning in 1942	
Newburgh, Dutchess & Conn. inc. mtg.	
Notes payable	
\$150,000 of N. D. & Conn. 1st	
N. Y. N. H. & H. R. R.	
Scrip.	

PROPERTIES LEASED.

Hartford & Connecticut Western R. R. Co., successor of the Connecticut Western R. R. Co. Lease runs 50 years from Aug. 30, 1890. Out of 29,670 shares, N. Y. N. H. & H. owns 705 shares, and Central New Eng. Ry. owns 16,400 shares. Of this latter amount 13,900 shares are pledged for the Central New Eng. Ry. first mortgage and general mortgage income bonds.

PROPERTIES CONSOLIDATED.

The Central New England Ry. Co. is the through reorganization after foreclosure of Philadelphia, Reading & New Eng. R. which was a merger of Poughkeepsie Bridge Co., and Central New Eng. & Western R. Co. this latter company being a consolidation of Hudson Connecting R. R. Co. and Poughkeepsie & Conn. R. R. Co. Merged with C. N. E. Ry. Co., Poughkeepsie Bridge R. R. Co., Dutchess County R. R. Co., Newburgh, Dutchess & Conn. R. R. Co. successor to Dutchess & Columbia R. Poughkeepsie & Eastern Ry. Co.

NEW YORK & STAMFORD RAILWAY CO.		
Outstanding.		
	Total.	Owned by N.Y.N.H.&H.
Capital stock (Par \$100)	\$500,000.00	\$500,000.00
Bonds:		
1st mtg. 5%, due Oct. 1, 1931...	426,000.00	
1st ref. mtg. 4%, due Nov. 1, 1958	274,000.00	27,000.00
Notes payable	290,030.47	290,030.47

THE RHODE ISLAND CO.	
Capital stock (Par \$100).....	\$9,685,500.00
Bonds:	
Providence & Burrillville	
St. Ry. 5% bonds...\$254,000.00	
Funds deposited with	
R. I. Hospital Trust	
Co. to redeem..... 254,000.00	

LEASED PROPERTY.

That portion of the Greenwich Tramway Co. west from Mianus River to New York State line.

LEASED PROPERTIES.

Union Railroad Co.
Rhode Island Suburban Railway Co.
Pawtucket St. Ry. Co.
999 years from June 24, 1902.
Total annual rental, \$1,061,642.00.

PROPERTIES.

Woonsocket
Columbia
Providence

MEMORANDUM.

The New England Navigation Co. owns 50% of Merchants & Miners Transportation Co.

THE HARTFORD	
Capital stock (Par \$25) ..	
Bonds:	
1st mtg. 4 1/2%, due May 1, 1942	
Notes payable	

Capital stock (Par \$50) ..	
Bonds:	
M. S. Co. of Maine 1st mtg.	
Portland Consol. S. & Co.	
Notes payable	
Sinking Fund 1st mtg.	
Sinking Fund 1st mtg.	

NEW YORK, NEW HAVEN & HARTFORD RAILROAD COMPANY SYSTEM, JUNE 30, 1910.

COMPANIES HELD OR OPERATED INDEPENDENTLY (REVENUE FROM WHICH GOES INTO THE SYSTEM)

STEAM RAILROAD AND CONSTRUCTION COMPANIES.

CENTRAL NEW ENGLAND RAILWAY CO.		
	Outstanding.	
	Total.	Owned by N.Y.N.H.&H.
Preferred stock (Par \$100).....	\$3,750,000.00	\$3,471,000.00
Common stock (Par \$100).....	4,800,000.00	4,488,550.00
Bonds:		
Central New Eng. 1st mtg. 2%, due Feb. 1, 1919.....	1,250,000.00	192,000.00
Poughkeepsie & Eastern Ry. 1st mtg. 5%, due Nov. 1, 1934.....	500,000.00	500,000.00
Dutchess County R. R. Co. 1st mtg. 4½%, due June 1, 1940.....	350,000.00	
Central New Eng. gen. mtg. 4%, due Feb. 1, 1949.....	7,250,000.00	7,037,000.00
Maximum rate 5½%, beginning in 1910.....		*442.39
Newburgh, Dutchess & Conn. 1st mtg. 6%, due Dec. 1, 1977.....	1,164,500.00	1,164,500.00
Notes payable.....	2,592,388.96	\$2,592,388.96
*150,000 of N. D. & Conn. 1st mtg. 7% bonds (all) pledged to secure note to N. Y. N. H. & H. R. R. Co.		
*Scrip.		

NEW YORK, ONTARIO & WESTERN RY. CO.		
	Outstanding.	
	Total.	Owned by N.Y.N.H.&H.
Preferred stock (Par \$100).....	\$4,000.00	\$2,200.00
Common stock (Par \$100).....	58,113,982.84	29,160,000.00
Bonds:		
Refunding mtg. 4%, due June 1, 1992.....	20,000,000.00	
General mtg. 4%, due June 1, 1955.....	3,948,000.00	
Collateral trust notes (two series).....	\$2,375,000.00	
Notes payable.....	944,894.81	
†First series, \$300,000.00 unpaid; last installment due Feb. 1, 1911. Secured by bond and mortgage of Scranton Coal Co.		
‡Second series, \$2,075,000.00 unpaid; last installment due Dec. 1, 1915. Secured by bond and mortgage of Elk Hill Coal & Iron Co.		
The payments of installments on the coal mortgages in both series are identical with the due dates and amounts of the notes.		

NEW YORK, WESTCHESTER & PORT JERVIS RY. CO.	
Capital stock (Par \$100).....	
Bonds:	
1st mtg. 5%, due Oct. 1, 1919.....	
1st mtg. (temporary) 5%, due Oct. 1, 1919.....	
(N. Y. & Port Chester iss.)	
Notes Payable:	
City & County Contract Co.	
Millbrook Co.	
*In process of construction.	
†Scrip.	

PROPERTIES CONSOLIDATED.
The Central New England Ry. Co. is the successor through reorganization after foreclosure of Philadelphia, Reading & New Eng. Railroad, which was a merger of Poughkeepsie Bridge Co., and Central New Eng. & Western R. R. Co., this latter company being a consolidation of Hudson Connecting R. R. Co. and Poughkeepsie & Conn. R. R. Co. Merged with C. N. E. Ry. Co., Poughkeepsie Bridge R. R. Co., Dutchess County R. R. Co., Newburgh, Dutchess & Conn. R. R. Co., successor to Dutchess & Columbia R. R. Co., Poughkeepsie & Eastern Ry. Co.

PROPERTIES LEASED.
Utica, Clinton & Binghamton R. R. Co.
Rome & Clinton R. R. Co.

PROPERTIES OWNED.
*Ontario, Carbondale & Scranton Ry. Co. (Purch'd 1889)
†Ellenville & Kingston R. R. Co. (" 1903)
‡Port Jervis, Monticello & Summitville R. R. Co. (" 1905)
§Wharton Valley Ry. Co. (" 1888)
¶Pecksport Connecting R. R. Co. (" 1896)
*All stock and bonds of this company pledged in the N. Y. O. & W. refunding mortgage.
†All stocks and bonds of these companies pledged in the N. Y. O. & W. general mortgage.
First four companies operated under lease.

THE CITY OF NEW YORK.
Capital stock (Par \$100).....
Notes Payable:
N. Y. N. H. & H. R. Co.
Westchester & Northbrook Co.
*Construction company

STREET RAILWAY COMPANIES.

THE RHODE ISLAND CO.		
	Outstanding.	
	Total.	Owned by N.Y.N.H.&H.
Capital stock (Par \$100).....	\$9,685,500.00	\$9,685,500.00
Bonds:		
Providence & Burrillville St. Ry. 5% bonds, ..\$254,000.00		
Funds deposited with R. I. Hospital Trust Co. to redeem.....	254,000.00	

THE WESTCHESTER STREET RAILROAD CO.
Organized Dec. 8, 1909, to acquire major portion of the property of the Tarrytown, White Plains & Mamaroneck Ry. Co. under foreclosure.
Application now pending before the New York Public Service Commission, 2d District, for authority to issue capital stock.
Notes payable, \$21,208.00, due the Connecticut Co.
Cash advances from the New York, New Haven & Hartford R. R. Co., \$907,840.43, to be paid in capital stock of company.

THE CONNECTICUT CO.		
	Outstanding.	
	Total.	Owned by N.Y.N.H.&H.
Capital stock (Par \$100).....	\$40,000,000.00	\$40,000,000.00

Capital stock (Par \$100).....
Bonds:
Berkshire
Hoosac Valley
Pittsfield
Hoosac Valley
Debtures:
Berkshire
Notes payable

LEASED PROPERTIES.
Railroad Co.
Island Suburban Railway Co.
et St. Ry. Co.
Leased from June 24, 1902.
annual rental, \$1,061,642.00.

PROPERTIES PURCHASED.
Woonsocket St. Ry. Co.
Columbian St. Ry. Co.
Providence & Burrillville St. Ry. Co.

PROPERTIES LEASED.
*Bridgeport Traction Co.
*Shelton St. Ry. Co.
*Milford St. Ry. Co.
*Westport & Saugatuck St. Ry. Co.
*Derby St. Ry. Co.
*Norwalk St. Ry. Co.
*Norwalk Tramway Co.
*Southington & Plantsville Tramway Co.
*Cheshire St. Ry. Co.
*Naugatuck Valley Elec. Ry. Co.
*Thomaston & Watertown Elec. Ry. Co.
*Waterbury Traction Co. (Street Ry. Dept.).
*The Central Railway & Elec. Co. (Street Ry. Dept.).
†West Shore Ry. Co.
‡South Manchester Light, Power & Tramway Co.
*All except last two companies were leased to Consolidated Ry. Co. by Connecticut Ry. & Ltg. Co. for 999 years from Aug. 1, 1906, and sublet to the Connecticut Co. by the N. Y. N. H. & H. R. R. Co.
† 99 years from Dec. 15, 1895.
‡ 25 years from May 15, 1895.

PROPERTIES PURCHASED.
The Columbia Traction Co.
The Peoples Tramway Co. (Portion south of the Danielson & Norwich St. Ry. Co.)
The Wallingford Tramway Co.
The Winchester Ave. R. R. Co.
The Fair Haven & Westville R. R. Co.
Meriden Electric R. R. Co.
The Norwich St. Ry. Co.
Montville St. Ry. Co.
New London St. Ry. Co.
The Middletown St. Ry. Co.
Hartford St. Ry. Co.
The East Hartford & Glastonbury St. Ry.
The Greenwich Tramway Co. (Equipment of line west to the Mianus River.)
The Branford Lighting & Water Co. (Railroad and exclusive use of power house.)
Stamford St. R. R. Co.
Willimantic Traction Co.
The Hartford & Middletown St. Ry. Co.
The Hartford, Manchester & Rockville Tramway Co.
The Waterbury & Pomperaug Valley St. Ry.
The Torrington & Winchester St. Ry. Co.
The Meriden, Southington & Compounce St. Ry. Co.
The Stafford Springs St. Ry. Co.
The Farmington St. Ry. Co.

MARINE COMPANIES.

THE HARTFORD & NEW YORK TRANSPORTATION CO.		
	Outstanding.	
	Total.	Owned by N. E. N. Co.
Capital stock (Par \$25).....	\$3,283,000.00	\$3,283,000.00
Bonds:		
1st mtg. 4½%, due Mar. 1, 1934.....	200,000.00	200,000.00
Notes payable.....	200,000.00	

MAINE STEAMSHIP CO. OF MAINE.		
	Outstanding.	
	Total.	Owned by H. & N. Y. T. Co.
Capital stock (Par \$50).....	\$333,350.00	\$333,250.00
Bonds:		
M. S. Co. of Maine 1st mtg. 6%, due Apr. 1, 1926.....	*225,000.00	16,000.00
Portland Consol. S. S. Co. 1st mtg. 5%, due July 1, 1921.....	\$325,000.00	
Notes payable.....	119,090.38	119,090.38
Sinking Fund 1st mtg. 6's... \$77,000 1st mtg. 6's.		
Sinking Fund 1st mtg. 5's... \$4,000 1st mtg. 5's.		
Sinking Fund 1st mtg. 5's... \$52,000 1st mtg. 5's.		

THE NEW ENGLAND NAVIGATION CO.†		
	Outstanding.	
	Total.	Owned by N.Y.N.H.&H. In N. E. N. Co.
Capital stock (Par \$100).....	\$53,000,000.00	\$53,000,000.00
Bonds:		
New London Steamboat Co. 1st mtg. 6%, due Jan. 1, 1916.....	*90,000.00	
Debtures:		
N. E. Nav. Co. 50-year 4%, due Jan. 1, 1955.....	\$675,000.00	
N. E. Nav. Co. gold 4%, due Nov. 13, 1955.....	\$3,600,000.00	
Providence Securities Co. 4%, due May 1, 1957.....	19,899,000.00	
† Incorporated as Colonial Commercial Co. May 14, 1901. Name changed to above Oct. 18, 1901.		
* Funds to redeem these bonds deposited with New York Trust Co., trustee.		
† Owned by Old Colony R. R. Co. Interest under terms of lease of Old Colony property to the N. Y. N. H. & H. R. R. Co.		
§ Owned by the Norwich & Worcester Railroad Co. Interest under terms of lease of Worcester property is payable to the N. Y. N. H. & H. R. R. Co.		

PROPERTIES PURCHASED.
Providence & Stonington Steamship Co.
Norwich & New York Transportation Co.
New Haven Steamboat Co.
New London Steamboat Co.
Bridgeport Steamboat Co.
Old Colony Steamboat Co.

ESTCHESTER & BOSTON RAILWAY CO.*		
	Outstanding.	
	Total.	Owned by N. Y. N. H. & H.
0).....	\$4,945,250.00	\$4,924,800.00
		137.50
t. 1, 1954.....	15,000,000.00	15,000,000.00
5%, due June 1, 1957.	100,000.00	100,000.00
ster issue.)		
tract Co.....	\$87,723.24	
	195,500.00	283,223.24
uction.		

WOOD RIVER BRANCH R. R.		
	Outstanding.	
	Total.	Owned by N. Y. N. H. & H.
Capital stock (Par \$100).....	\$60,000.00	\$33,600.00
Bonds:		
1st mtg. due July 1, 1924..	56,500.00	
Notes payable.....	4,500.00	4,500.00

WESTCHESTER NORTHERN R. R. CO.*		
	Outstanding.	
	Total.	Owned by C. & C. C. Co.
Capital stock (Par \$100).....	\$60,000.00	\$60,000.00
*Construction not yet begun.		

	Per cent. owned.
Park Square Real Est. Trust.....	100
New York Connecting R. R. Co.....	50
Boston Terminal Co.....	40
Roxbury Central Wharf Co.....	100
South Bay Wharf and Terminal Co...	100

BENNINGTON & NORTH ADAMS ST. RY. CO.		
	Outstanding.	
	Total.	Owned by N.Y.N.H.&H.
Capital stock (Par \$100).....	\$650,000.00	\$650,000.00
Notes payable	351,498.18	351,498.18
Livingstone deficiency judgment	363,389.03	363,389.03

THE HOOSICK FALLS RAILROAD CO.
Application to New York Public Service Commission, 2d
District, for authority to issue \$100,000.00 capital stock.
Organized May 17, 1910, to acquire property of Benning-
ton & North Adams St. Ry. Co. in the State of New
York under foreclosure of mortgage. When stock is
issued it is to go to N. Y. N. H. & H. R. Co.

PROPERTIES MERGED.
Hoosack Valley St. Ry. Co.
Pittsfield Electric St. Ry. Co.

PROPERTIES MERGED.
Hoosick Railway Co.
Bennington Electric Ry. Co.

THE GREENWICH TRAMWAY CO.
That portion west from Mianus River
to New York State line.
No stock or liabilities.
Leased to N. Y. & Stamford Ry. Co.

THE SUFFIELD ST. RY. CO.
No stock or liabilities.
From just south of Suffield to Massa-
chusetts State line.

THE PEOPLES TRAMWAY CO.
That portion from West Thompson,
Conn., to North Grosvenordale.

Street railway line from North Grosvenordale to Massachusetts State line.

HOUSATONIC POWER CO.		
	Outstanding.	
	Total.	Owned by N. E. N. Co.
Capital stock (Par \$100).....	\$3,000,000.00	\$3,000,000.00
Bonds:		
New Milford Power Co. 1st mtg. 5%, due Aug. 1, 1932.	1,000,000.00	
Notes payable	979,565.23	979,565.23

PROPERTIES LEASED.

Norwalk & South Norwalk Elec. Light Co.
Norwalk Gas Light Co.
The Central Railway & Elec. Co. (Lighting Dept.)
Greenwich Gas & Elec. Lighting Co.
Nauaugatuck Electric Light Co.
Waterbury Traction Co. (Lighting Dept.)
Operated by United Gas & Improvement Co. for the
benefit of H. P. Co.-Waterbury Gas Light Co.

PROPERTIES PURCHASED.

The Branford Lighting & Water Co.
(Lighting and water portion and power station.)
Village Water Co. of Suffield.
New Milford Power Co.
Power Station and Transmission Line at Quassapoag.

whose main work has been in six directions: (1) the almost complete reconstruction of the main stem with adaptation to higher train loads and equipment to match; (2) the acquisition of the New York, Ontario & Western and (3) of the Poughkeepsie bridge system, built up into high prosperity by transfer of freight; (4) the development of the New England Navigation system and the purchase of new boat lines; (5) control of the Boston & Maine; and (6) the extensive acquisition of street railways.

The results are evidenced impressively but yet incompletely by the genealogical chart shown herewith, for it does not include the many lines merged into the Boston & Maine, nor the trolley systems of Worcester, Springfield and elsewhere in Massachusetts held under "sympathetic" control by the New England Investment & Security Company. It may be stated summarily, however, that the New Haven system proper has 4,460 miles of single track (the road mileage being about 2,000); adding the Boston & Maine single trackage of 4,175 miles, the total reaches 8,635 miles. But the expansion of the street railway policy under President Mellen has been even more striking. When he took hold, seven years ago, the New Haven controlled but two small, localized trolley lines in Connecticut. It now has seven-eighths of the trolley mileage of that state; almost all the Rhode Island trolleys; and some 500 miles in Massachusetts, the total single track mileage of street railways owned or controlled by the corporation is about 1,400—and the end is not yet. As a whole, the trolley investments of the company are just about self-supporting. There is a net gain in Connecticut; about a corresponding loss in Rhode Island; while the Massachusetts trolleys about wash the investment. As the trolley business moves steadily upward the situation means future profit along with the important advantage of parallel trolley control and defense.

As a measure of the degree of consolidation the official statement can be cited that the New Haven system now represents no less than 305 corporations and properties originally independent.

SUPERHEATED STEAM IN LOCOMOTIVE SERVICE.

Two reports relating to research work on locomotive performance by Dr. W. F. M. Goss, under the patronage of the Carnegie Institution at Washington, have been published. The first related to the performance of a locomotive using saturated steam, and the second to that of a locomotive using superheated steam. Liberal extracts from these reports, dealing more particularly with the Purdue tests, were given in a paper by Dr. Goss which forms a part of the proceedings of the American Railway Master Mechanics' Association for 1909.

A more elaborate presentation of the facts in the second report has recently been made in publication No. 127 issued by the Carnegie Institution of Washington. The various sections of the report relate to: First, foreign practice in the use of superheated steam; second, the American attitude toward the use of superheated steam in locomotives; third, tests to determine the value of superheating in locomotive service; fourth, performance of boiler and superheater; fifth, performance of the engine and of the locomotive as a whole; sixth, locomotive efficiency as affected by its running schedule; seventh, economy resulting from the use of superheated steam; the appendix contains all data and diagrams in detail.

Under foreign practice is given an interesting account of the development of the superheater for locomotives on the Prussian State Railway, commenced in 1898 by Wilhelm Schmidt and Robert Garbe. This also describes the special design of piston valve and piston rod packing used in Germany for superheater locomotives.

In the statement relating to the American attitude toward the superheater, Dr. Goss says: "These statements will serve to show that the ideal underlying practice in the development of the modern American locomotive has placed power-capacity and

continuity of service upon a higher plane than thermodynamic efficiency. This ideal has on the whole not been misleading. It has produced locomotives of unprecedented power; it has satisfied a legitimate demand for service; and it has resulted in the development of a machine which must always be regarded as a mechanism of remarkable quality. This in itself has been a great achievement. It is, therefore, not discreditable to the railways of America that their interest in superheating has thus far been hardly more than academic, for the advent of the superheater brings complications of mechanism with it and introduces new problems in maintenance. . . . The time is approaching when, in the natural order of development, the railways of the United States will leave no stone unturned in their efforts to increase the thermodynamic efficiency of the American locomotive. Such an attitude involves no abandonment, but merely an enlargement of existing ideals. Progress in this direction means, in its ultimate analysis, the sacrifice of nothing already possessed, but the addition thereto of greater economy in the use of fuel and an extension in the amount of power developed."

The tests of the superheater locomotive on the Purdue testing plant were made November, 1906, to July, 1907, and during that time the locomotive performed a service equivalent to 4,851 miles. "The intermittent tests were designed to disclose the effect on its efficiency of certain conditions which enter into the normal operation of a locomotive. The writer long ago called attention to the fact that not less than 20 per cent. of the total fuel used by the average locomotive in this country was not utilized in advancing trains over the road, but was consumed in starting fires, in raising steam, in keeping the locomotive hot while waiting for its trains, while stopping at stations and at passing points, or remained in the firebox at the end of the run. Obviously, no embellishment in the design of a locomotive can effect a saving in that portion of the total fuel supply which is thus accounted for. The advantage to be derived from such an embellishment as a superheater must, therefore, be judged by the effect it can produce on not more than 80 per cent. of the coal consumed. If, for example, it were shown that the superheater can effect a saving of 20 per cent. in the amount of fuel used, the saving in total fuel which it will be necessary to supply will be 20 per cent. of 80, or 16 per cent. only."

The advantage of increased power obtained by the use of superheated steam is explained as follows: "It has been shown that for the development of equal amounts of power the combined boiler and superheater of the superheating locomotive have an efficiency which equals or exceeds that of the saturated-steam boiler; hence the boiler-power which it may be made to deliver as a maximum equals or exceeds that which the boiler of the saturated-steam locomotive can be made to deliver. But each unit of power delivered from the boiler in the form of superheated steam is more effective in doing work in the cylinders than a similar unit of power delivered in the form of saturated steam; hence, at the limit, the superheating locomotive is more powerful than the one using saturated steam, and the difference is that which measures the difference in the economy with which the cylinders use steam. The same question may be dealt with through another series of facts, as follows: It can be shown that the power of any locomotive is limited by its capacity to burn coal, and coal-burning capacity is a function of the draft. The data shows that for the development of a given cylinder power the draft values of *Schenectady No. 3* (superheating) were in all cases less than those of *Schenectady No. 2* (saturated). Tests at 160 lbs. show that the power developed in return for a given draft is from 10 per cent. to 16 per cent. greater for the superheating locomotive than for the saturated-steam locomotive. Obviously, there is no reason why the draft for the former should not be increased to limits practicable with the latter, and when this is done the power developed by the superheating locomotive will exceed that which is possible with the saturated-steam locomotive."

The possible economy resulting from the use of the super-

heater and its relation to the degree of superheat is discussed as follows: "The Purdue tests dealt principally with steam superheated to approximately 150 deg. Fahr. The gain in any service resulting from superheating is a function of the degree of superheat employed. The Prussian State Railway prescribes a boiler pressure of 180 lbs., and a degree of superheat of 190 deg. Fahr. is regarded as satisfactory, while the maximum limit never to be exceeded is 280 deg. Fahr. Under normal conditions in Prussian State Railway practice, the superheating is considerably above 200 deg. Fahr. Comparing this with the Purdue locomotive working under a pressure of 180 lbs., the temperature of the steam in those tests may have been increased by 33 per cent. without exceeding the limit which has proved practicable in the every-day practice of the German railways. The saving in water and fuel resulting from this increase would be proportionate to that increase."

The whole question of the economy of superheating, as far as fuel is concerned, is thus summarized: "The actual net reduction in the amount of fuel needed for locomotive use by a railway having all of its locomotives equipped with satisfactory superheaters, over that which would be necessary if all required saturated steam, will not be far from 10 per cent. This value is not to be accepted as of strictly scientific import, but merely as an estimate based on such facts as have appeared in the course of a rather careful study of the problem."

A summary of conclusions relating to the whole investigation is given below:

SUMMARY OF CONCLUSIONS.

1. Foreign practice has proved that superheated steam may be successfully used in locomotive service without involving mechanism which is unduly complicated or difficult to maintain.
2. There is ample evidence to prove that the various details in contact with the highly heated steam, such as the superheater, piping, valves, pistons, and rod packing, as employed in German practice, give practically no trouble in maintenance; they are ordinarily not the things most in need of attention when a locomotive is held for repairs.
3. The results of tests confirm, in general terms, the statements of German engineers to the effect that superheating materially reduces the consumption of water and fuel and increases the power capacity of the locomotive.
4. The combined boiler and superheater tested contains 943 ft. of water-heating surface and 193 ft. of superheating surface; it delivers steam which is superheated approximately 150 deg. The amount of superheat diminishes when the boiler pressure is increased, and increases when the rate of evaporation is increased, the precise relation being

$$T = 123 - 0.265P + 7.28 H$$

where T represents the superheat in degrees Fahrenheit, P the boiler pressure by gage, and H the equivalent evaporation per foot of water-heating surface per hour.

5. The evaporation efficiency of the combined boiler and superheater tested is

$$E = 11.706 - 0.214 H$$

where E is the equivalent evaporation per pound of fuel and H is the equivalent evaporation per hour per foot of water heating and superheating surface.

6. The addition of the superheater to a boiler originally designed for saturated steam involved some reduction in the total area of heat-transmitting surface, but the efficiency of the combination when developing a given amount of power was not lower than that of the original boiler.
7. The ratio of the heat absorbed per foot of superheating surface to that absorbed per foot of water-heating surface ranges from 0.34 to 0.53, the value increasing as the rate of evaporation is increased.
8. When the boiler and superheater are operated at normal maximum power, and when they are served with Pennsylvania

or West Virginia coal of good quality, the available heat supplied is accounted for approximately as follows:

	Per cent.
Absorbed by water	52
Absorbed by steam in superheater.....	5
Utilized	57
Lost in vaporizing moisture in coal.....	5
Lost in CO.....	1
Lost through high temperature of escaping gases.....	14
Lost in the form of sparks and cinders.....	12
Lost through grate	4
Lost through radiation, leakage, and unaccounted for....	7

9. The water consumption under normal conditions of running has been established as follows:

Boiler-pressure. Pounds.	Corresponding steam per indicated horse-power hour. Pounds.
120	23.8
160	22.3
200	21.6
240	22.6

The minimum steam consumption for the several pressures is materially below the value given. The least for any test was 20.29 lbs.

10. The coal consumption under normal conditions of running has been established as follows:

Boiler-pressure. Pounds.	Coal consumed per indicated horse-power hour. Pounds.
120	3.31
160	3.08
200	2.97
240	3.12

11. Neither the steam nor the coal consumption are materially affected by considerable changes in boiler pressure, a fact which justifies the use of comparatively low pressures in connection with superheating.

12. Contrary to the usual conception, the conditions of cut-off attending maximum cylinder efficiency are substantially the same for steam superheated 150 deg. as for saturated steam. With superheated steam, when the boiler pressure is 120, the best cut-off is approximately 50 per cent. stroke, but this value should be diminished as the pressure is raised, until at 240 lbs. it becomes 20 per cent.

13. Tests under low steam pressures, for which the cut-off is later than half stroke, give evidence of superheat in the exhaust.

14. The saving in water consumption and in coal consumption per unit power developed which was effected by the superheating locomotive *Schenectady No. 3* in comparison with the saturated-steam locomotive *Schenectady No. 2* is as follows:

Saving in water consumption.				Saving in coal consumption.			
Locomotive.				Locomotive.			
Boiler-pressure.	Saturated steam.	Super-heating.	Gain.	Boiler-pressure.	Saturated steam.	Super-heating.	Gain.
Pounds.	Pounds.	Pounds.	Per cent.	Pounds.	Pounds.	Pounds.	Per cent.
120	29.1	23.8	18	120	4.00	3.31	17
160	26.6	22.3	16	160	3.59	3.08	14
200	25.5	21.6	15	200	3.43	2.97	13
240	24.7	22.6	9	240	3.31	3.12	6

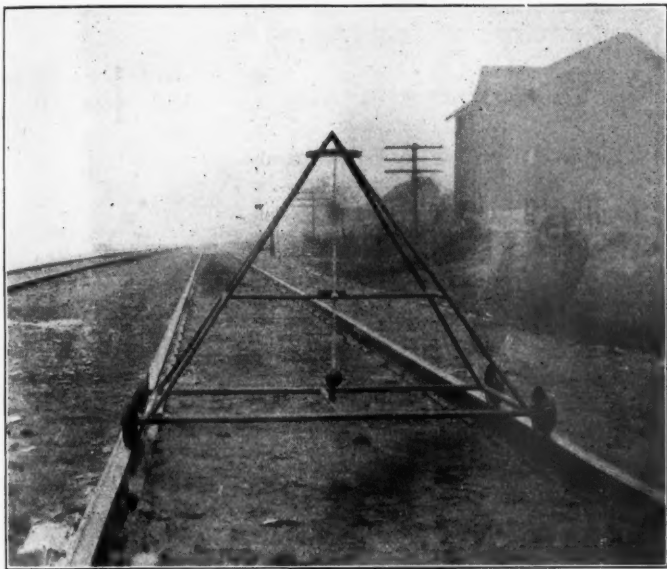
15. The power capacity of the superheating locomotive is greater than that of the saturated-steam locomotive.

16. Tests involving intermittent running show that the steam consumption per unit work delivered is increased when the program of operations is made to involve intervals of rest, due doubtless to the cooling of the cylinders and the connected parts. This loss increases with increase of steam pressure. When the program of operations involves equal periods of rest and running it amounts to from 5 to 10 per cent. of the consumption under constant running; adding to this the losses resulting from low efficiency when starting and the radiation and stack losses during the periods of idleness, the total loss resulting from such intermittent running, as compared with constant running, is approximately 20 per cent.

On November 3 last a new section of the line connecting the West of Minas Railway, Brazil, with the port of Angra dos Reis, in the state of Rio de Janeiro, was opened to traffic. The new section extends from station Rio Claro to Alto da Serra.

HILL TRACK LEVEL.

The Burlington is using a combination track gage and level of a new and novel design, the idea originating with James J. Hill and having been worked out under his direction. As shown in the illustration, it consists of a rectangular base built of 1-in. steel tubing and mounted on four wheels, the wheels being 6 in. in diameter, with $\frac{3}{4}$ -in. flange. The distance out to out of flange is exactly the track gage. On this base a pyramid of $\frac{3}{4}$ -in. tubing is built, with a horizontal cross bar at about one-half the height, to which a level bubble is attached. A pendulum is also pivoted on the same cross bar, the lower end being



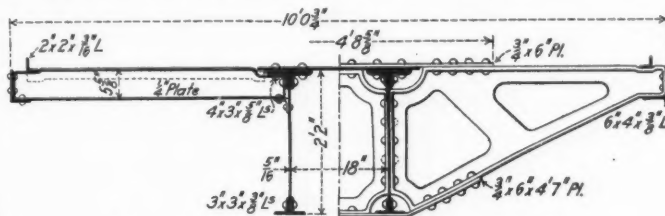
Hill Track Level.

weighted and the upper end running to a point and moving along the arc of the circle, which is fastened to the frame near its top. On level track the pendulum points to zero, the arc of the circle being so graduated that the difference in elevation of the two rails is correctly indicated on the dial, the smallest reading being 0.2 in. By pushing this over the track the foreman is able to check his gage, while the dial reading indicates high or low spots on tangent or the elevation on curves. When not in use the pendulum can be held rigid by a thumb screw at the base. About 35 of these instruments are now in use on the La Crosse division, having been built in the company's shops. A patent has been applied for.

The Hungarian authorities have been contemplating an increase in passenger fares. The famous zone tariff, introduced in 1889, made a very great reduction from the high rates previously charged, especially for long-distance travel, of which there had been very little. It is not so generally known that this zone tariff has been raised three times since it was first introduced, with no bad effect on the amount of traffic. The average per passenger mile, however, remains very nearly as low in Hungary as in Austria and Germany, although the travel is much less, and the cost, therefore, greater. When the zone tariff was introduced it was thought that one of its effects would be to fill the trains better, and it had that effect at first: only 24 per cent. of the seats were occupied in 1888; for a short time after the zone tariff was applied the proportion increased to 34 per cent.; then decreased from year to year until it is now about 23 per cent. It is also suggested that when the tariff is changed the zone system be abandoned, and changes be made according to distance, though, perhaps, not in proportion to distance, the rate per mile decreasing somewhat for the greater distances, as is now the case in Italy.

STEEL SLEEPING CARS FOR THE ST. PAUL.

The Chicago, Milwaukee & St. Paul recently received 59 steel sleeping cars from the Pullman Company. These were part of an order which included 59 steel coaches, 20 dining-cars, 8 tourist cars and 4 parlor cars. They are 72 ft. 6 in. long and 10

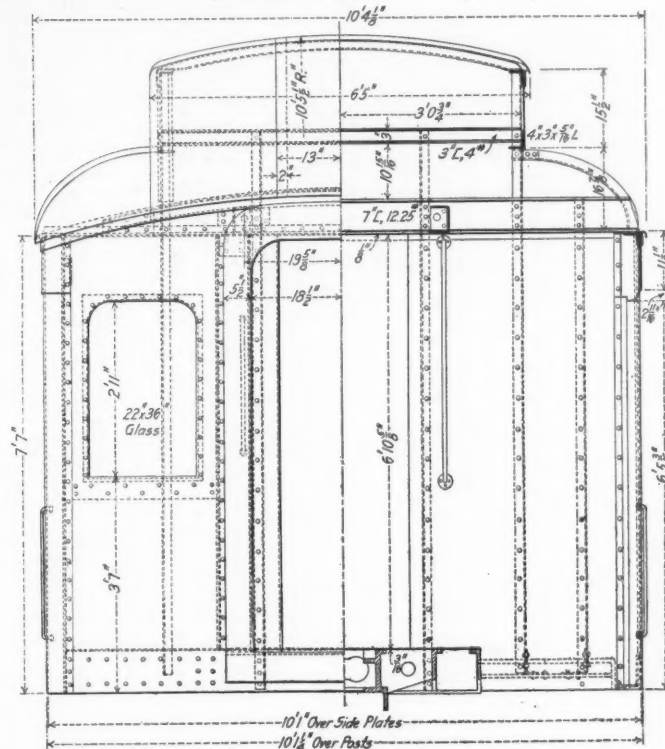
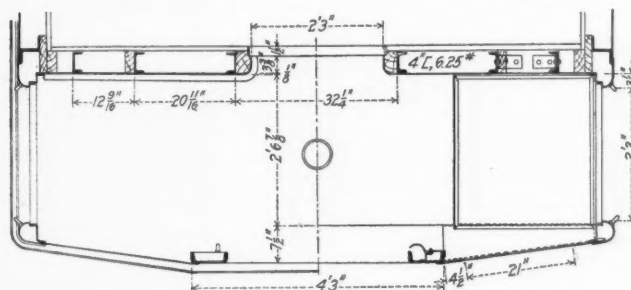


Section at Diaphragm.

Section at Needle Beam.

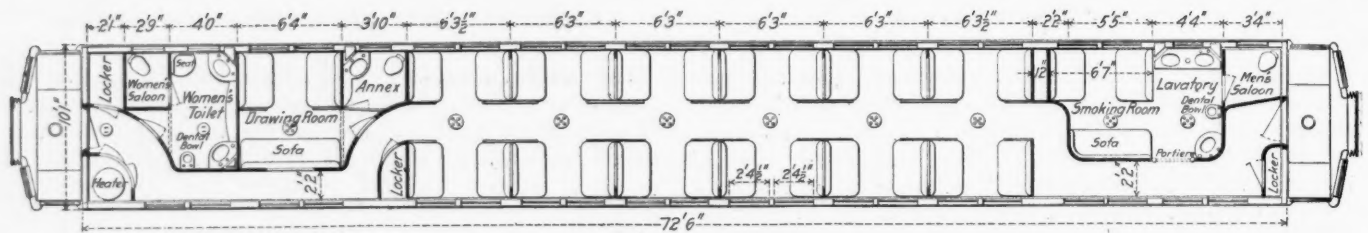
Section Through Underframe.

ft. 1 in. wide over the sills, the width being 5 in. greater than the Pullman standard section. This is in accordance with the regular practice of the road. The construction of the underframe is similar to that used by the Pullman Company for the Pennsylvania Railroad. The two center sills are plate girders

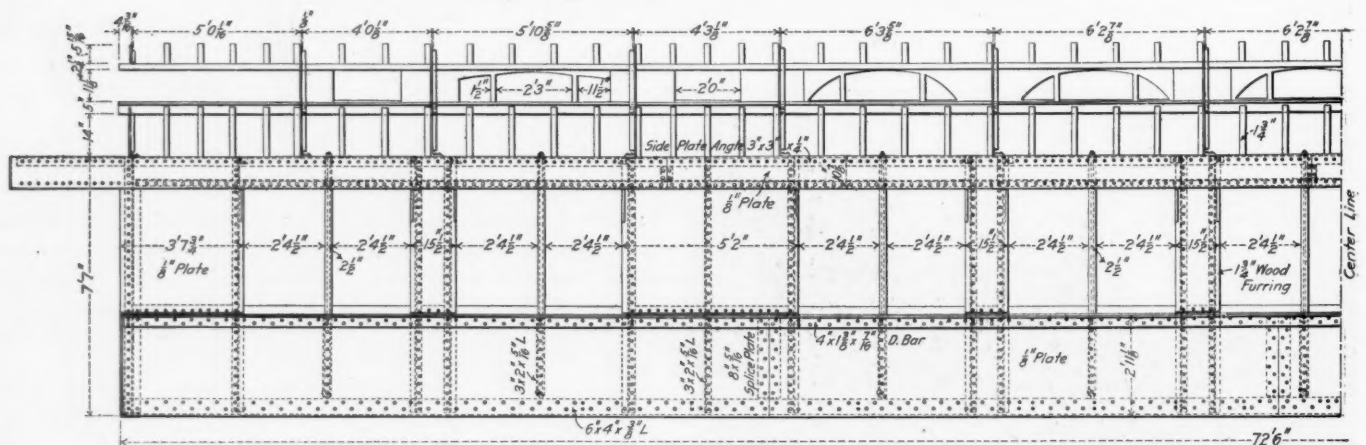


Part Elevation, Section and Plan of Vestibule.

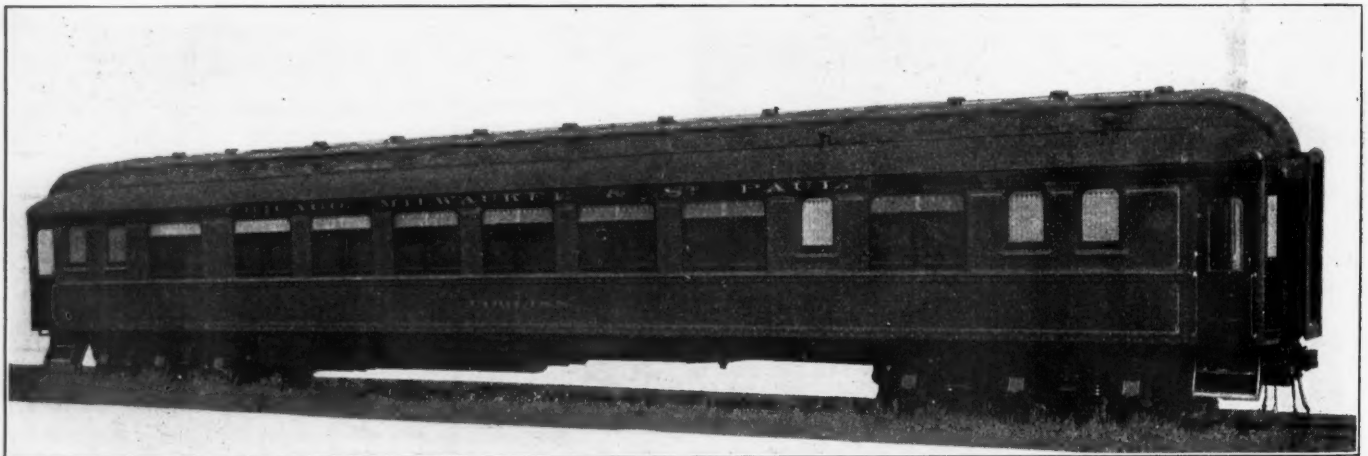
2 ft. 2 in. deep, made up of 4 in. \times 3 in. \times $\frac{5}{8}$ in. upper angles, a 5-16 in. web, 3 in. \times 3 in. \times $\frac{3}{8}$ in. lower angles, and a continuous cover plate on the top, 30 in. \times $\frac{1}{2}$ in. The center sills extend between the cast steel double bolsters at the ends, which are composite steel castings, including the bolster and platform. The side sills, 6 in. \times 4 in. \times $\frac{3}{8}$ in. angles are tied to the center sills by two needle beams built up of steel castings and by the



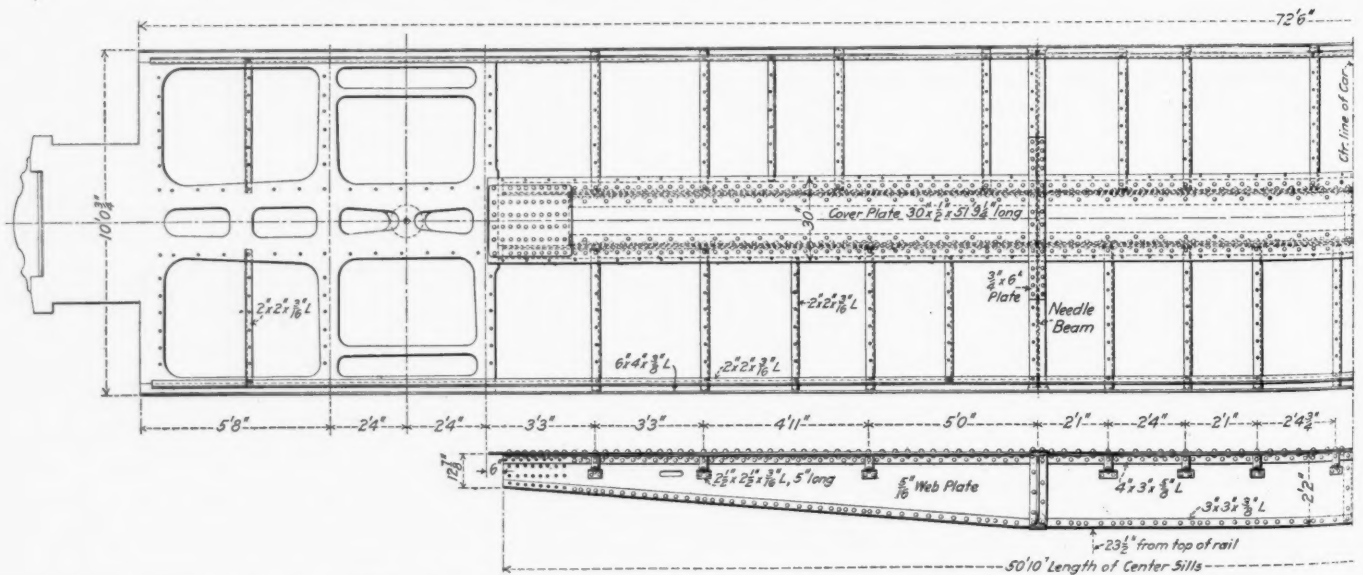
Plan of Steel Sleeping Car; Chicago, Milwaukee & St. Paul.



Part Elevation of Side Framing of Steel Sleeping Car.



Steel Sleeping Car; Chicago, Milwaukee & St. Paul.



Part Plan and Section of Underframe of Steel Sleeping Car.

diaphragms. The illustrations show clearly the underframe construction; also the steel super-structure and the vestibule, which is in accordance with the Pullman standards. The side construction, which is shown in detail, is made up entirely of rolled sections, principally angles; the belt rail is a 4 in. \times 1 $\frac{3}{8}$ in. \times 7-16 in. angle, and is connected to the side sill angles by 3 in. \times 2 in. \times $\frac{1}{4}$ in. vertical angle posts. The floor is built up of 1-16 in. steel plates, corrugated longitudinally; hair felt insulation; wooden furring strips, Keystone flooring and is covered with a layer of Flexolith.

On the inside the sleeping compartment contains 12 Pullman sections. It is finished in Cuban mahogany, the men's smoking



Interior of Steel Sleeping Car; Chicago, Milwaukee & St. Paul.

room and lavatory in English oak, the drawing-room in Koko wood and the women's toilet in Vermillion. The arrangement of these compartments is shown in the plan. The decorations consist of inlaid wood, and "twentieth century" style color work for the ceilings. A dynamo in the baggage car and the railway's standard storage batteries furnish electric light. An auxiliary gas lighting system is provided, and the Chicago Car Heating company's vapor system of heating is used.

The six-wheel trucks have 38 in. Paige wheels, and weigh 21,000 lbs. each. The car body weighs 110,300 lbs., which makes the total weight 152,300 lbs.

Nearly all of the Japanese railways were built as narrow-gauge lines, which in a country almost without wagon roads, seemed to serve every purpose. Experience in the Russian war, however, has convinced the authorities that they are not effective when a heavy traffic must be handled, and it has been determined to make the whole lines from Tokio southwest to Shimonoseki, opposite Corea, of 4 ft. 8 $\frac{1}{2}$ in. gage, and also the road in Corea, from Fusan, opposite Shimonoseki, by Seoul to the Manchurian border at Wiju. The line thence to the South Manchurian railway has already been changed. The line from Tokio to Shimonoseki is 801 miles long; the Corean line about 500; and that connecting it with Siberian line about 150. Traffic with the Siberian and the Chinese railways can be exchanged much better by sea than by this long line, the direction of which is southwest from Tokio to the straits, and thence northwest. Aside from the local traffic, strategical reasons have doubtless determined the change, which is to be completed in 13 years.

EXTENSION OF THE SIBERIAN RAILWAYS.

It is reported that the Russian government contemplates the improvement of the existing Siberian railway and creating duplicate approaches both in European Russia and the Far East. When these works are completed, in 1915, the imperial treasury will have expended on the Siberian railway somewhat over \$1,000,000,000, which includes both cost of construction and loss on exploitation. In exchange for this Russia will have a complete double-track system from the Ural mountains to the Pacific, with double approaches, of a total length of 6,844 miles. During 1910 the Ministry of Communications introduced into the Duma three bills providing for parts of this vast work. The first is to double the Baikal-Kultchuk section of the Circumbaikal railway, the second is concerned with the eastern part of the new Amur railway, and the third is for double tracking the existing Transbaikal railway. The most important work strategically is the Amur railway, which will supply Russia with communication with the Far East, running through Russian territory alone, as against the existing Chinese Eastern line. The new Amur line will be 1,344 miles long, and, as officially estimated, will cost \$121,050,000, but including rolling stock, and guarding during construction, the cost is put at \$149,244,000. With the completion of this work, which has been two years in hand, Russia will for the first time have railway communication with the Far East lying entirely in native territory. The second great work under way is connecting St. Petersburg, Russia, and the European Northern railway system with the main Siberian line, the chief approach to which has hitherto been through Moscow and Central Russia. This new line runs through the towns of Perm, Ekaterinburg, and Tyumen, and joins the Siberian railway at Omsk. The section from Perm to Ekaterinburg is finished. The total cost of this new approach and incidental improvements will be \$43,243,000. Doubling and improving the existing track of the Siberian railway is the next work. This was begun in 1907. For three sections of doubling work, and for reconstructing the hilly parts of the Eastern Siberian railway, between Atchinsk and Irkutsk, the Ministry of Communications has asked for \$82,309,000, but in addition there are sections for which no estimates have yet been prepared. Adding these costs, calculated on the basis of past outlays, the Russian engineer, Mikhailovsky, puts the cost of reconstructing the existing Siberian line at \$97,966,000. This makes a total cost of new works undertaken during the past three years of \$290,453,000. Engineering defects in the line will remain in steep gradients in the Transbaikal railway, which require double traction, a large number of short curves, and wooden bridges over the narrow rivers, which are constantly destroyed by fire. The correction of these defects will bring the total to \$302,210,000. The statistical department of the Ministry of Communications put the construction outlay up to 1907 on the Siberian and Manchurian railways at \$422,412,000. The losses on exploitation during the 14 years which have elapsed since 1896, when the western section of the Siberian line was opened, are given at \$211,693,000. The exploitation losses for the six years which will elapse before the present schemes are finished will amount to about \$60,831,000. This makes the total cost of the completed Siberian Railway \$997,146,000, or about \$146,827 per mile, notwithstanding that practically no compensation had to be paid for land, and that more than half the line runs through flat territory.

No new lines were opened for traffic in the Transvaal, South Africa, during 1909, but the construction of the following lines, with an estimated length of 504 miles, was authorized and is now in hand: Pietersburg to Bandolier Kop, 70 miles; Welverdiend to Saltpans, with branch line to Lichtenburg, 146 miles; Ermelo to Piet Retief, 70 miles; extension of Selati line to Tzaneen, 140 $\frac{1}{2}$ miles; Benoni-Welgedacht line, 18 $\frac{1}{2}$ miles; Waterworks-Wepener line, 59 miles. All the above are in the Transvaal, except the Waterworks-Wepener line, which is in Orange River Colony.

General News Section.

The Chicago, Burlington & Quincy Association of Operating Officers held its annual meeting at Chicago, February 20, 21 and 22.

President Diaz of Mexico has presented to S. M. Felton, president of the Chicago Great Western, an excellent portrait of himself painted by the Mexican artist, Romero. The portrait is 3 ft. x 4 ft. in size.

Employees of the Pennsylvania Railroad have been notified that the privileges of St. John's Orphanage, Philadelphia, are available for the daughters of employees of the road who have been killed in the discharge of their duties. This orphanage was endowed by J. Edgar Thomson, former president of the road.

Suit has been brought in the federal court at Indianapolis, Ind., against the Cleveland, Cincinnati, Chicago & St. Louis, for alleged violation of the 16-hour law. It is alleged that the crew of a train running between Indianapolis, Ind., and Mattoon, Ill., on January 9, 1911, was kept in service unlawfully more than 16 hours.

E. Moody Boynton, of Massachusetts, who once built a short railway in which the cars ran on a single rail, and who has projected schemes of this kind a number of times in past years, is still alive; and in Boston last week he applied to the legislature for leave to build such a railway from Boston to Fall River, Providence and other places.

The bill providing for the inspection of locomotive boilers under the supervision of inspectors appointed by the President and the Interstate Commerce Commission, was signed by the President February 17. After the passage of this bill in the Senate, as reported in the *Railway Age Gazette* of January 20, it was amended by the addition of a section limiting the total expenditures under it to \$300,000 a year.

Northbound train No. 36 of the Southern Railway was stopped by robbers near Gainesville, Ga., on the morning of February 18, and the money in the safe in the express car was carried off. The robbers did not go into the passenger cars. The train was stopped by a red light, at a station, the robbers having bound and gagged the station agent. They went off in an automobile and scattered red pepper along the road to prevent being followed by blood-hounds.

The appraisers appointed by the Massachusetts legislature to make an inquiry as to the valuation of the property of the New York, New Haven & Hartford have filed their detailed report. As announced in these columns previously, the appraisers find that the value of the property exceeds the securities issued on this property. The appraisers' figure now show that they estimate the property of the New Haven, excluding intangible assets, at \$496,000,000, while the total obligations of the company are \$340,000,000.

The Western Union Telegraph Company has notified the railways with which it has working contracts that messages not on the business of the railway must not be sent free, because of the liability to incur the penalties of the Interstate Commerce Law. It is said that the messages aimed at by this notice are those in which the railways order tickets and sleeping car berths for passengers. The railways reply that messages of this character are railway business and are not prohibited by the terms of the law.

The Denver & Rio Grande and the Colorado & Southern have made a contract under which the D. & R. G. gets trackage rights over the C. & S. between Gunnison, Colo., and the Baldwin coal mines, and between Gunnison and Ohio City and Pitkin; and the Colorado & Southern gets trackage rights over the Denver & Rio Grande from Leadville, Colo., to Dillon. In each case the trackage rights are exclusive, the owning road retiring entirely from the use of the tracks in question. The two roads own parallel lines between the places mentioned, and the present action means the abolition of fruitless competition.

Offers of compromise amounting to several million dollars have been made by the Southern Pacific to the Department of Justice in an endeavor to end twenty-five suits brought by the

Government to recover about 70,000 acres of mineral land in Nevada. The twenty-five suits are now before the Circuit Court at Carson City, Nev. The Government claimed that under the land law of 1862 the Central Pacific, which has been merged in the Southern Pacific, acquired the land illegally. If the offer is accepted and the suits called off the railway company would return to the Government thousands of acres of mineral bearing lands.

The Post Office Department has issued an order that railway mail clerks on the heavy lines shall be required to work an average of only six hours a day, and clerks who have to do terminal work at either end of their runs will be allowed over-time. For many weeks back clerks on many railways, both east and west, have been complaining of over-work, their hours having been lengthened as a part of the general scheme of economy introduced by Postmaster Hitchcock. Many clerks on the heavy runs are on duty ten hours or more every day, for six days, and the average of six hours a day, mentioned in the order, includes the days when clerks remain off the cars and spend two or three hours daily in studying their geography lessons, which study is a part of their duties.

The Lehigh Valley Railroad Company has sent notice to the New Jersey legislature that the company intends to abandon the use of the Morris canal for navigation, surrendering to the state substantially all of the rights enjoyed by it in connection with its control of the canal. The canal company every year falls several thousand dollars short of paying expenses. The largest boat on the canal carries only 70 tons and takes five days to traverse the length of the canal, which is from the Delaware river at Phillipsburg to the Hudson river at Jersey City. This canal was chartered in 1824. Soon after the opening of railways from the anthracite coal mines to tidewater, it went into insolvency; because of the competition of the locomotives; and was reorganized in 1844. The canal company has the right to use water from lake Hopatcong and Greenwood lake. These rights will be surrendered to the state.

The boilermakers in a number of shops of the New York Central Lines went out on strike on Monday of this week, the chief grievance being objections to the piece-work system. The leaders of the boilermakers' brotherhood claim that 800 men have struck, but officers of the road say that this is an exaggeration; also that some of the strikers have returned to work and the places of some others have been filled with non-union men. On the Lake Shore & Michigan Southern, the superintendent of motive power says that of the 203 boilermakers employed by the company, only 97 left their work; and before an hour 16 of these decided to return. This officer says that the men have the option of working by the piece or not; and that the men working by the new plan earned in January 47.6 cents an hour, as against 35 cents made by the men who worked by the day. Similar comparisons are made with reference to other shops. An officer of the road in New York City says that the largest shops east of Buffalo are not affected.

Aristocrats All Around Us.

One statistician tells us that 746,221 individuals own the stock of all the railways and industrial corporations of the country. This is astounding, and we hope the report is exaggerated. If it be true, something should be done about it. It looks very bad to have such a large aristocracy. An aristocracy worthy of the name and the position should be small and exclusive. We are perfectly willing to work hard and support stockholders who are dignified and rare, but they must not allow themselves to become common.—*Life*.

Additional Automatic Stops in New York Subway.

The New York Public Service Commission, First district, has ordered the Interborough Rapid Transit Company to install and maintain stops in connection with all of its stop signals on the local tracks, the work to be done before July 1, 1911. On the express tracks the Interborough has automatic

block signals, with automatic stops throughout, but on the local tracks signals (controlled by track circuits, like block signals) are in use only at curves and other places where the motor-man's view of the preceding train is obstructed or obscure. The commission considered a proposition to require the use of the block system complete on the local tracks, but finally concluded to agree with the officers of the road that, with trains stopping every quarter mile or thereabouts, the use of block signals throughout the lines would seriously delay the trains.

3,000 Miles in 75 Hours.

The above heading tells approximately the speed made by a special train which arrived in New York last Sunday night from Yuma, Ariz., over the Southern Pacific, the Rock Island Lines and the New York Central Lines. The train carried Charles G. Gates, who had suffered a slight bodily injury in California and who was in a hurry to reach his family doctor in New York. The time made by the train over different parts of its journey is shown in the record below:

	Distance. Miles.	Time.
Yuma, Ariz. ....Thursday, 16th..Lv. 5:30 p. m., P.T.		
El Paso, Tex. ....Friday..... 7:00 a. m.	564	
Hutchinson, Kan. ....Saturday..... 6:14 a. m.	724.5	
	1,288.5	
Chicago, Ill. ....Sunday.....Ar. 4:50 a. m., C.T.	738.5	
Yuma to Chicago	2,027	57 h. 20 m.
Chicago, 31st st. ....Sunday.....Lv. 5:02 a. m., C.T.		
Elkhart	6:48 a. m.	99
Toledo	9:04 a. m.	133
Cleveland	10:45 a. m.	108
Buffalo	Ar. 1:52 p. m., C.T.	181
Chicago, 31st street, to Buffalo, Seneca street.....	521	8 h. 50 m.
Yuma to Buffalo.....	2,548	66 h. 10 m.
Buffalo, Seneca street.....Lv. 2:55 p. m., E.T.		
Syracuse	5:32 p. m.	149
Albany	8:26 p. m.	148
New York	Ar. 10:49 p. m., E.T.	142
Buffalo to New York	439	7 h. 54 m.
Chicago to New York	960	16 h. 47 m.
Yuma to New York.....	2,787	74 h. 19 m.

From Yuma to El Paso, the route was over the Southern Pacific; from El Paso to Chicago, the El Paso & Southwestern and other lines controlled by the Chicago, Rock Island & Pacific; from Chicago to Buffalo, the Lake Shore & Michigan Southern, and from Buffalo to New York, over the New York Central & Hudson River. The distances shown in our record differ from those in the time-tables, because of short distances cut off at Chicago & Buffalo. At Chicago, the Rock Island delivered the train to the Lake Shore at Thirty-first street, which is two miles from the terminus, cutting off this distance both from the Rock Island Line and that of the Lake Shore. At Buffalo, in like manner, about one mile is saved.

West of Chicago a large part of the line traversed by this train is single track; and near Volland, Kan., there was a delay of about two hours because of the derailment of a freight train. In spite of this the average speed from El Paso to Topeka was about 45 miles an hour. Between Syracuse and Albany there was about 20 minutes delay, because of a train ahead. From Albany to New York, the time, 143 minutes, is said to be the best which has ever been made over the Hudson division and this, notwithstanding the necessity of changing engines at the beginning of the electric division at High Bridge, seven miles out of New York.

The time from Chicago to New York, which was 1 hour and 13 minutes better than that of the regular 18-hour trains, was a trifle slower than that of a special train which was run in March, 1909. From Yuma to New York, the rate of speed, including all stops, was 40.41 miles an hour.

American Association of General Baggage Agents.

At the annual meeting of the American Association of General Baggage Agents, held at San Antonio, Tex., February 15 and 16, the following officers were elected for the ensuing year: President, F. H. Jones (St. Louis Southwestern); vice-president, Ben-

ton Quick (Missouri Pacific); secretary-treasurer, J. E. Quick (Grand Trunk); members of the executive committee, George H. Lee, George L. Alley and C. J. Wiggin. New York was chosen as the place of the next annual meeting.

American Railway Bridge and Building Association.

The March meeting of the Bridge and Building Association will be held at the Auditorium hotel in Chicago, on Wednesday evening, March 22. As many of the members will be in attendance at the convention of the Maintenance of Way Association and the exhibition of railway appliances, it is thought that a good attendance of the members of the association can be secured at this meeting. Further information concerning the meeting can be obtained at the booth of Fairbanks, Morse & Co., in spaces 92-95 at the Coliseum, during the week of the exhibition.

American Railway Engineering and Maintenance of Way Association.

At the Tuesday evening (March 21) session of the American Railway Engineering and Maintenance of Way Association convention, M. H. Wickhorst, engineer of tests for the rail committee, will present an illustrated paper which will be a digest of the investigations made by the rail committee during the past year. After the reading of the paper there will be an informal smoker. The annual banquet of the association will be held March 22 in the Auditorium hotel.

Western Railway Club.

At the regular monthly meeting of the Western Railway Club, held at the Auditorium hotel, Chicago, on February 21, T. W. Demarest, superintendent of motive power of the Pennsylvania Lines at Ft. Wayne, Ind., presented a paper on M. C. B. Interchange Inspection at the Union Stock Yards, Chicago.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual convention, May 23-26, Chicago.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911; Niagara Falls, N. Y.
- AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., 1911.
- AMERICAN ASSOCIATION OF LOCAL FREIGHT AGENTS.—R. O. Wells, East St. Louis, Mo.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
- AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 17, New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; next meeting, March 22, Chicago.
- AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION.—E. H. Fritch, Monadnock building, Chicago; March 21-23, 1911, Chicago.
- AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 9, 1911; Detroit, Mich.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wednesdays, except June and August; New York.
- AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York; 3d Tuesday of each month, New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York; next convention, May 30-June 2, Pittsburgh, Pa.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago; semi-annual, June, Washington, D. C.; annual, November, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston, Mass.

- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York; June 20-21, 1911, Cape May City, N. J.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug.; Montreal.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal.
- CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; annual, October 9, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo, N. Y.
- CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug.; St. Paul.
- ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; June 21, St. Paul, Minn.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wednesday preceding 3d Thursday; Chicago; annual, July 29, Chicago.
- INDIANAPOLIS RAILWAY AND MECHANICAL CLUB.—B. S. Downey, C., H. & D., Indianapolis, Ind.
- INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911; Chattanooga, Tenn.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn. Next convention July 25-27, Chicago.
- INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
- INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.
- IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
- MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.; Sept. 12-15, 1911, Atlantic City, N. J.
- NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept.; Boston.
- NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
- NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P.; 4th Saturday; Richmond, Va.; 20th annual, June 21, 1911, St. Paul, Minn.
- OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Bldg.; second Wed.
- RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo., 3d Friday in month; Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.; March 20, Chicago; annual, Oct. 10, Colorado Springs, Colo.
- RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911; Milwaukee, Wis.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis; annual, Oct. 20, Atlanta.
- SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Sept. 12-14, St. Paul, Minn.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.; semi-annual, April 20, Atlanta, Ga.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Prudential bldg., Atlanta, Ga.; 3d Thurs.; Jan., April, August and Nov.; Atlanta.
- TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday; annual, May 6, 1911; Toledo.
- TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
- TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly; Pittsburgh.
- TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore, Md.
- TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 11, 1911.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; annual, August, 1911, Chicago.
- WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August; annual, May 8, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
- WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August; Chicago.
- WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago.

Traffic News.

The Cincinnati Transportation Club has decided to issue a call for a meeting of all the traffic clubs in the country, for the purpose of forming a national traffic organization.

A press despatch from Memphis, Tenn., says that the railways south of the Ohio river, and also some of those north of it, contemplate increasing, by 1 cent per 100 lbs., their rates on lumber.

The Pennsylvania Railroad has adopted a rate of 2½ cents a mile for all local passenger fares on its lines in the state of Pennsylvania. The new tariffs make no important changes except in isolated cases. Some fares are slightly increased and others slightly decreased.

The railways have lengthened the schedules of some of their freight and passenger trains between Chicago and St. Paul, and the traffic committee of the Chicago Association of Commerce has taken steps looking to a conference with the railways, claiming that Chicago shippers are suffering from the slow time.

On February 20 through merchandise car service was established from Chicago to points in the southwest via the Burlington, the Nashville, Chattanooga & St. Louis and connections. The cars will leave Chicago daily at 7.15 p. m., and arrive at Paducah, Ky., at 9.30 p. m. on the second day. Freight will reach Atlanta, Ga., on the second day from Paducah.

The special educational good roads train of the Pennsylvania Railroad, which has lately been traversing the lines of the company in western Pennsylvania, gathered audiences aggregating more than 13,000 people. Sixty-one lectures were given and an additional lecture car was put on the train. The train is in charge of Prof. John P. Jackson, dean of the School of Engineering of the Pennsylvania State College. It is to visit the eastern part of the state. W. B. Thomson, one of the division engineers of the road, is giving addresses on the subject of good roads before farmers' institutes.

Traffic Club of New York

At the meeting of the Traffic Club of New York, to be held on February 28, Calvin Tomkins, commissioner of docks and ferries of the city of New York, will speak on The Port of New York. The lecture will be illustrated by both stereopticon views and models, showing the tentative plans of the proposed railway and canal terminals.

INTERSTATE COMMERCE COMMISSION.

Loss Due to Ignorance of Best Routes.

A. C. Parfrey v. Chicago, Milwaukee & St. Paul et al.

Rate of 34½ cents per 100 lbs. for transportation of cheese boxes in carloads, Richland Center, Wis., to Dodgeville, Wis., found unreasonable. Reparation awarded.

Complainant alleged that the rates exacted by defendants for the transportation of four carloads of cheese boxes from Richmond Center to Dodgeville, Wis., in 1909, were unreasonable in so far as they exceeded a joint commodity rate subsequently established. The freight charges collected amounted to \$205.46. The shipments were carried from Madison to destination by the Illinois Central, partly through Illinois. Defendants stated that a joint rate of 17½ cents was in effect over the lines of the Chicago, Milwaukee & St. Paul and the Chicago & North Western wholly within Wisconsin. The distance by the intrastate route is 104 miles, by the interstate route 168 miles. Complainant was unaware of a difference in rates over the two routes, and directed the movement via the Illinois Central upon request of consignee. No rate was inserted in any of the bills of lading. Afterward defendants established a joint commodity rate of 17½ cents; but we are not inclined to hold that defendants should be required to accept a rate which appears to have been deemed reasonable over a much shorter route. On the other hand, we find that the rate collected, amounting to 4.1 cents per ton per mile, was somewhat excessive, and that a rate of 28½ cents would have afforded fair compensation; and reparation is ordered in the sum of \$31.33, with interest from October 6, 1909. (20 I. C. C. 104.)

Name of road.

Mileage operated at end of period

Name of road.

EXPENSES OF RAILWAYS.									
(SEE ALSO ISSUES FEBRUARY 10 AND 17.)									
Operating revenues									
Operating expenses									
Operating income (or loss)									
Increase (or decrease) comp. with last year.									
Taxes.									
Outside operations, net.									
Net operating revenue (or deficit).									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									
General.									
Trans- portation.									
Traffic.									
Way and structures.									
Maintenance of equipment.									
Total.									

COURT NEWS.

The new commerce court will hold its first hearings in Washington on April 3, though one of the judges (Judge Mack) is going to California between now and that time to take testimony in suits concerning switching charges at San Francisco and Los Angeles. It is said that probably the case that will be heard at Washington, April 3, will be that of the Louisville & Nashville vs. The Interstate Commerce Commission.

The Supreme Court of the United States, in an opinion by Mr. Justice Hughes, has sustained the constitutionality of the law of Iowa, passed in 1898, enabling an employee of the operating department of a railway to sue his employer for injuries, notwithstanding the fact that he had received injury benefits from a relief department supported partially by the road. The suit was that of Charles L. McGuire against the Chicago, Burlington & Quincy for \$2,000 damages for injuries. McGuire had received \$882 from the Burlington Relief Department. One of the regulations of the department was that employees must elect between accepting relief from it and prosecuting a claim against the company. The company first contended that the recovery from the relief fund was a bar to the action in court, and, when that was decided against it, an attack was made on the constitutionality of the law. The Supreme Court of Iowa upheld the constitutionality of the law and that decision is now affirmed.

The Supreme Court of the United States has decided in favor of Frederick Weyerhaeuser and others the suit brought by them against Herbert H. Hoyt for possession of Northern Pacific lands. Weyerhaeuser was the grantee of the Northern Pacific of certain lands which the road had selected under a public land grant. Hoyt was the grantee of a homesteader who had filed on the lands subsequent to the date on which the road made its selections and filed them in the land office, but prior to the time the railway's selections were approved by the Secretary of the Interior. In an opinion by Chief Justice White the Supreme Court holds that the action of the Secretary of the Interior in approving the selections by the Northern Pacific related back to the date of the filing of the selections in the local land office and thereby gave priority to the railway. Justices Harlan and Day dissented from the opinion and Justice Harlan read a dissenting opinion in which he held that the majority opinion of the court had reversed the uniform rule of decisions of the Supreme Court and that held that the filing of a list of selections by a railway company under a land grant created no title as of that date; that the title did not vest until the selections were approved by the Secretary of the Interior. On the trial of the case in the Circuit Court for the District of Minnesota the railway grantees won. On appeal to the Circuit Court of Appeals this decision was reversed, and the Supreme Court now reverses the Court of Appeals and sustained the Circuit Court for the District of Minnesota.

The Supreme Court of the United States on Monday of this week issued a large number of decisions. Besides that noted above, cases were decided embodying the following points:

That a passenger has no right to buy tickets with services, advertising, releases, or property, nor may the railway buy services, advertising, releases or property with transportation.

That a state law regulating the size of crews on trains within the state is not an obstruction to interstate commerce, but may be an aid; and a means of public safety.

That the supreme court may review the validity of an order of the Interstate Commerce Commission, even though the two-year limitation on the life of the order has expired.

That a railway may not escape regulation as an instrument of interstate commerce in the matter of wharf privileges because one of its constituent parts is a wharfage company.

That the Interstate Commerce Commission may not reduce a rate as "unjust and unreasonable" merely because it is inequitable under some circumstances.

The most recent section of the Cape to Cairo Railway from the north to be completed is understood to be from Khartum to Wad Madani, a point about 100 miles south of Khartum.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Frederick H. Prince, vice-president of the Chicago Junction Railways and Union Stock Yards Company, has been elected president, succeeding Nathaniel Thayer, resigned on account of ill health, and Eugene V. R. Thayer has been elected vice-president.

Operating Officers.

E. A. Sollitt, road foreman of engines of the Wabash at Montpelier, Ohio, has been appointed trainmaster, with office at Moberly, Mo., succeeding J. W. Jones, promoted.

J. E. Taussig, superintendent of terminals of the Wabash Railroad at St. Louis, Mo., has been appointed superintendent of terminals of the Houston & Texas Central, with office at Houston, Texas.

J. W. Jones, trainmaster of the Wabash Railroad at Moberly, Mo., has been appointed superintendent of terminals, with office at St. Louis, Mo., succeeding J. E. Taussig, resigned, to go to another company.

H. Hatcher, superintendent of the Southern Railway in Mississippi at Columbus, Miss., has been appointed general superintendent of the Georgia, Southern & Florida, with office at Macon, Ga., succeeding O. M. Grady, resigned.

W. H. Averell, whose resignation as superintendent of the Los Angeles division of the Southern Pacific, has been announced in these columns, has been appointed an assistant on the staff of the general manager of the Baltimore & Ohio, with office at Baltimore, Md., effective March 1.

J. A. Gordon, superintendent of the Southern division of the Chicago Great Western at Des Moines, Iowa, has been appointed superintendent of the Eastern division, with office at Chicago, succeeding W. B. Causey, and Mr. Causey succeeds Mr. Gordon on the Southern division. C. E. Carson has been appointed superintendent, with office at Clarion, Iowa, succeeding M. Dailey, resigned.

T. A. Shea, who has been appointed superintendent of the Missouri Pacific, with office at Aurora, Mo., as was previously announced in these columns, was born in Virginia in 1870. He began railway work when he was 12 years old as a messenger for the Chesapeake & Ohio, and he was later made a telegraph operator. In 1889 he became a fireman with the Plant System of Railways, now the Atlantic Coast Line, and was afterwards promoted to engineer and then trainmaster. In 1894 he went with the Illinois Central, where he was conductor for two years, and during the period from 1897 to 1902 he was despatcher and then chief despatcher of the Atlantic Coast Line. His next position was despatcher for the Missouri Pacific at De Soto, Mo. He was promoted to chief despatcher at Poplar Bluff, Mo., in 1906, and was transferred with the same title to Little Rock, Ark., in 1907. He was appointed trainmaster, with office at Little Rock, in 1908, from which position he is now promoted to superintendent as above.

C. E. Carson, who has been appointed superintendent of the Chicago Great Western, with office at Clarion, Iowa, was born January 9, 1867, at Portsmouth, Ohio. He graduated from Carleton College at Syracuse, Ohio, in 1884, and began railway work in the same year with the Kansas City, Ft. Scott & Memphis, now part of the St. Louis & San Francisco, at Kansas City, Mo. He was first a switchman, and was promoted consecutively to brakeman, conductor, yardmaster and general yardmaster. For four years from 1893 he was chief clerk to the superintendent of the Terminal Railroad Association of St. Louis, and was appointed superintendent of terminals of the Missouri Pacific at Kansas City in 1897. In 1902 he was transferred with the same title to St. Louis, where he remained about two years, becoming superintendent of the Colorado & Southern at Denver, Colo., in December, 1903. Three years later he went with the Mexican Central and the National Lines of Mexico as superintendent, with office at Tampico, Mex., remaining there

for two years. He was then made manager of the Mexican Fuel Company, which position he held at the time of his appointment to the superintendency of the Chicago Great Western as above.

Traffic Officers.

C. Lacy Goodrich has been appointed general Oriental agent of the Western Pacific, with office at Yokohama, Japan.

T. K. Partridge has been appointed traveling freight agent of the Kansas City, Mexico & Orient, with office at Wichita, Kan.

E. F. Bertling has been appointed a traveling freight agent of the Union Pacific, with office at Cincinnati, Ohio, succeeding W. G. Tabbert, resigned.

W. P. Moats has been appointed general agent of the Kansas City Southern, with office at Mexico City, Mex., his territory comprising the Republic of Mexico.

A. W. Boyle has been appointed a traveling freight agent of the St. Louis, Iron Mountain & Southern, with office at New Orleans, La., succeeding N. C. Barnett, resigned.

J. C. Fraser, traveling freight agent of the Chattanooga Southern at Birmingham, Ala., has been appointed a soliciting agent of the Central of Georgia, with office at Montgomery, Ala.

M. Clarke, until October, 1910, general agent of the Tonopah & Goldfield at San Francisco, Cal., has been appointed a contracting freight agent of the Illinois Central, with office at San Francisco.

A. D. Aiken, commercial agent of the Chicago, Rock Island & Pacific at McAlester, Okla., has been appointed a commercial agent, with office at St. Joseph, Mo., succeeding R. F. Atwood, promoted.

A. S. Hindman has been appointed agent of the Michigan Central-Lackawanna Fast Freight Line, with office at Chicago, succeeding C. C. Campbell, promoted. W. H. Norie has been appointed a traveling freight agent, with office at Chicago.

C. M. Burkhalter, district freight and passenger agent of the Southern Pacific at Oakland, Cal., has been appointed general agent in the freight department of the Sunset and Atlantic Steamship Lines, with office at San Francisco, Cal. As has been announced in these columns, L. Richardson succeeds Mr. Burkhalter.

S. A. Kendig, traveling passenger agent of the Atchison, Topeka & Santa Fe at Galveston, Texas, has been appointed colonization agent of the Gulf, Colorado & Santa Fe, with office at Galveston, succeeding to part of the duties of G. A. Dobbin, industrial and colonization agent, resigned. H. Y. Williams, assistant city passenger agent at Fort Worth, Texas, succeeds Mr. Kendig as traveling passenger agent, with office at Temple, Texas, instead of at Galveston.

Incident to the promotion of Samuel G. Hatch from general passenger agent of the Illinois Central, the Indianapolis Southern and the Yazoo & Mississippi Valley at Chicago to passenger traffic manager, John A. Scott, assistant general passenger agent of the Illinois Central at Memphis, Tenn., has been appointed general passenger agent, with jurisdiction over the lines of the Illinois Central south of the Ohio river and over the Yazoo & Mississippi Valley, with office at Memphis. H. J. Phelps, division passenger agent of the Illinois Central at Dubuque, Iowa, has been appointed general passenger agent of the northern and western lines of the Illinois Central and of the Indianapolis Southern, with office at Chicago. W. H. Brill, division passenger agent of the Illinois Central at St. Louis, Mo., has been appointed an assistant general passenger agent of the Illinois Central and the Yazoo & Mississippi Valley, with office at New Orleans, La., and G. H. Bower, general baggage agent of the Missouri, Kansas & Texas at Parsons, Kan., has been appointed an assistant general passenger agent of the Illinois Central and the Indianapolis Southern, with office at Chicago. J. M. Morisey, district passenger agent at Indianapolis, Ind., succeeds Mr. Phelps as division passenger agent at Dubuque, and A. J. McDougall succeeds Mr. Morisey. F. D. Miller, district passenger agent at Birmingham, Ala., succeeds Mr. Brill as division passenger agent at St. Louis, and Robert Anderson succeeds Mr. Miller. The appointments are effective March 1.

Samuel G. Hatch, whose appointment as passenger traffic manager of the Illinois Central, the Indianapolis Southern and the Yazoo & Mississippi Valley, with office at Chicago, has been announced in these columns, was born March 22, 1865, at St. Louis, Mo.



Samuel G. Hatch.

He began railway work in 1880, as a clerk in the general passenger department of the St. Louis, Keokuk & Northwestern, now a part of the Chicago, Burlington & Quincy. Two years later he was promoted to ticket agent of that road and the Burlington at Keokuk, Iowa, remaining there until 1885. In November, 1888, he was made traveling passenger agent of the St. Louis, Arkansas & Texas, now the St. Louis Southwestern; he was afterward promoted to district passenger agent at Louisville, Ky., and then to chief in the general passenger department. He was appointed district passenger and ticket agent of the Chesapeake & Ohio Southwestern at Memphis, Tenn., in March, 1895, and a year later was promoted to general passenger agent. In August, 1896, he went with the Illinois Central as division passenger agent at Cincinnati, Ohio, and was promoted to assistant general passenger agent, at Chicago in April, 1900. In July, 1905, he was appointed general passenger agent, from which office he has now been promoted to passenger traffic manager as above.

Engineering and Rolling Stock Officers.

O. S. Jackson, master mechanic of the Chicago, Indianapolis & Louisville at Lafayette, Ind., has been appointed superintendent of motive power of the Chicago, Terre Haute & South-eastern, with office at Terre Haute, Ind.

William P. Carroll, whose appointment as master mechanic of the New York Central & Hudson River, with office at Rochester, N. Y., has been announced in these columns, was



W. P. Carroll.

born July 21, 1876, at Buffalo. He was educated in the high school of his native town and began railway work in August, 1895, with the Buffalo & Susquehanna as a machinist's apprentice. The following year he left the service of that company to go to the Lukens Iron & Steel Company, and was later a machinist with the Baldwin Locomotive Works. He went to the Pennsylvania Railroad as a machinist in 1898, and the following year left that company to go to the New York Central in the same capacity, since which time he has been consecutively, 1901, engine inspector; 1902, air brake inspector; 1905, engine house foreman, and 1907, general foreman, which position he held at the time of his recent appointment as master mechanic in charge of the territory between Rochester and Syracuse with all branches. Mr. Carroll received most of his railway training under C. H. Hogan, assistant superintendent of motive power of the New York Central & Hudson River.

Burchill Richardson Moore, whose appointment as superintendent of motive power of the Duluth & Iron Range was announced in the *Railway Age Gazette* of February 3, page 259, was born September 5, 1865, at Sumter, S. C. He was educated at the State Normal Academy at Fredonia, N. Y., and held an apprenticeship at the Brooks Locomotive Works from 1881 to 1885. In the latter year he began railway work with the Union Pacific as draftsman and machinist, and he remained with that company 13 years, first at Omaha, Neb., and later being transferred to Kansas City, Kan.; Cheyenne, Wyo.; and Denver, Colo. His next position was with the Atchison, Topeka & Santa Fe, with which road he did special work in California for a year.



B. R. Moore.

In April, 1899, he was appointed chief draftsman on the Chicago & North Western, and three years later was promoted to mechanical engineer of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, Minn. He was later promoted to assistant superintendent of motive power and machinery at Sioux City, Iowa, and for a year from June, 1908, was engaged in a private enterprise. In May, 1909, he was appointed master mechanic of the Mississippi Central, with office at Hattiesburg, Miss., which office he has just resigned to become superintendent of motive power of the Duluth & Iron Range, with office at Two Harbors, Minn.

Purchasing Officers.

W. L. Cooper has been appointed a division storekeeper of the Mobile & Ohio, with office at Murphysboro, Ill., succeeding D. L. Balch, transferred.

OBITUARY.

Charles D. Simonson, special agent in the freight department of the Chicago, Rock Island & Pacific at New York, died on February 15, at his home in Brooklyn, N. Y., at the age of 70 years.

John Franklin Hinckley, formerly chief engineer of the St. Louis & San Francisco, died on February 20, at the home of his sister in St. Louis, Mo. Mr. Hinckley was born in Boston, Mass., and after being graduated from the School of Technology in that city he went to St. Louis and entered the service of the St. Louis & San Francisco in the engineering department as chief engineer, a position he held until he resigned two years ago to begin private practice.

William Ashbridge Baldwin, former president of the Cleveland & Marietta, which is now a part of the Pennsylvania System, died in Sewickley, Pa., February 17. Mr. Baldwin was born on June 28, 1835, at Philadelphia, and began railway work in November, 1851, with a party of engineers making surveys in Schuylkill county, Pa. In March, 1857, he went to Honduras, Central America, as assistant engineer, leveler and topographer on the Honduras Inter-Oceanic Railway. In December of the following year he returned to this country and entered the employ of the Pennsylvania Railroad. In 1862 he was appointed superintendent of the Western division of the Philadelphia & Erie. By May, 1870, he had become general superintendent of the Philadelphia & Erie division, and in September, 1881, he was appointed manager of the Pennsylvania Lines West of Pittsburgh. In 1888 he went to the Buffalo, Rochester & Pittsburgh as vice-president and general manager, but five years later he returned to the Pennsylvania System and was made president of the Cleveland & Marietta.

Railway Construction.

New Incorporations, Surveys, Etc.

ALGOMA CENTRAL & HUDSON BAY.—An officer writes that a contract has been given to the Superior Construction Company, Ltd., Espanola, Ont., for building an extension of the Manitoulin & North Shore from Crean Hill, to Whitefish. Maximum grades will be 1.5 per cent., and maximum curvature 12 deg. There will probably be three bridges, but the construction of the bridges has not yet been determined. There will be a swing bridge between Goat island and Manitoulin island. The line is being built to carry ore, forest products, live stock and merchandise. (February 17, p. 334.)

BOISE & INTERURBAN.—A contract has been given to Edward Hedden for making surveys for an extension, it is said, from Caldwell, Idaho, west to Roswell, about 20 miles.

CANADIAN PACIFIC.—According to press reports, this company will let contracts, and start work soon on a line from Toronto, Ont., east via Whitby, Oshawa, Bowmanville, Port Hope, Cobourg and Belleville, thence northeasterly to the main line at Bathurst, from which place double-track is to be laid on the existing line to Smith's Falls. From Smith's Falls the line is already double-tracked to Montreal.

The railway commissioners of Canada have authorized the Canadian Pacific to construct its Moose Jaw branch northwesterly across 108 highways, and to divert the line between mile post 9.59. and mile post 119.6.

CANADIAN RAILWAYS.—Residents of northern Ontario have petitioned the government to build a line to Gowganda and Elk river, in Ontario.

CHICAGO, BURLINGTON & QUINCY.—It is expected that the new line from Thermopolis, Wyo., will be finished soon through the Big Horn canyon, and that this section will be opened for local traffic. The line is to be continued east through Wyoming to Orin Junction.

COLUMBIA & PUGET SOUND.—Double-tracking work is said to be under way from Seattle, Wash., south to Renton, 12 miles.

GRAHAM COUNTY RAILROAD.—The plans call for building a 43-mile from Tipton, N. C., north via Robinsville along the Cheowah river. Surveys are being made. D. Merrick, president, Asheville; D. B. Burns, chief engineer.

GRAND TRUNK PACIFIC.—This company is said to have finished locating a branch line between Vancouver and Fort George, B. C.

GRANTS PASS & ROGUE RIVER.—This company has been incorporated in Oregon with \$900,000 capital. Financial arrangements have been made to begin construction work on a section from Grants Pass, Ore., along the valleys of Rogue river and Williams creek to the Oregon caves in southern Oregon. A. D. Bowen, president; H. L. Chapin, vice-president, Portland. J. E. Riggs, Grants Pass, is an incorporator.

HAWKINSVILLE & WESTERN.—This company expects to complete financial arrangements and begin work soon on a line from Hawkinsville, Ga., northwest to Perry, 22 miles. T. B. Ragan, president.

HUGO & ATOKA NORTHWESTERN.—This company, which has not yet completed its organization, will probably build a 50-mile line from Hugo, Okla., northwest either via Atoka or Reynolds. Surveys have been made. P. B. Bigger, secretary, Chamber of Commerce, Hugo, may be addressed.

LONG ISLAND.—An officer writes that double-tracking work on the Oyster Bay branch between Glen Cove, N. Y., and Locust Valley will probably be finished during 1911. All material is on hand and the work will be carried out by the company's men. No plans have been made at the present time for electrifying the Oyster Bay branch.

MANITOULIN & NORTH SHORE.—See Algoma Central & Hudson Bay.

MIDLAND VALLEY.—An officer of the Midland Valley writes that this company operates 300 miles of railway, in connect-

tion with large coal properties in Arkansas, owned by the same interests, all of which have been developed by Philadelphia capital, is extending its line from Arkansas City, Kansas, northwest to Wichita, 55 miles. The Wichita & Midland Valley is building this line, which is to be leased to the Midland Valley. The company has bought about 30 acres of land in the central part of Wichita, for terminal yards and facilities. The city of Wichita and the counties through which the new line is to be built, voted on February 14 \$127,000 county bonds, being the full legal amount of county railway aid bonds. At Wichita connections can be made with several transcontinental systems.

MONTGOMERY COUNTY RAPID TRANSIT.—This company has decided to extend its line, it is said, from Skippack, Pa., to a number of places in Perkiomen valley, instead of in North Penn valley, as originally planned.

NEVADA COPPER BELT.—According to press reports, the extension from Mason, Nev., has been finished to Hudson in Smith valley, and is now open for traffic. The extension is to be continued to Morning Star mine, 15 miles from Mason. P. J. Conway, Bridgeport, Cal., is the contractor. (December 9, p. 1130.)

NEW ORLEANS, FORT JACKSON & GRAND ISLE.—See New Orleans Southern.

NEW ORLEANS SOUTHERN.—An officer writes regarding the reports that extensive improvements are to be made on the New Orleans, Fort Jackson & Grand Isle, which operates a 60-mile line from New Orleans, La., to Buras, that no definite plans have yet been made to carry out these improvements.

NORTH CAROLINA ROADS.—The Merchants' & Manufacturers' Association of Greensboro, N. C., associated with residents of that place have applied for a charter to build from Greensboro to Carey. The line is to be extended ultimately to Winston and across the mountains into the coal fields. The line will traverse a fine farming and lumbering section. Connection is to be made at Carey with an extension of the Norfolk Southern, which is to be built from Raleigh, about five miles. A bill is now before the state legislature to authorize the construction of the line. C. H. Ireland, Greensboro, may be addressed.

PITTSBURG, BUTLER, HARMONY & NEW CASTLE (Electric).—This company will probably build during 1911 a line from New Castle, Pa., north via Wilmington, East Middlesex, South Sharon, Sharon and Sharpsville to Conneaut lake, about 50 miles.

SALISBURY RAILWAY.—An officer writes that the plans call for a line from Salisbury, N. C., south via Faith, Mount Pleasant, Monroe and Jefferson, S. C., to McBee, about 100 miles. W. H. Miller, president, Salisbury.

SAND SPRINGS INTERURBAN.—An officer writes that grading contracts have been given to Ketchum Brothers and Albro Martin, for building seven miles between Tulsa, Okla., and Sand Springs. The work involves handling about 7,000 cu. yds. a mile. There will be one 20-ft. steel bridge and two trestles, each 30 ft. long. Charles Page, president; W. H. Hendron, engineer, Tulsa.

SHAWNEE SHORT LINE (ELECTRIC), SHAWNEE, OKLA.—Organized to build interurban lines to Denison, Texas, and from Oklahoma City through Shawnee and Muskogee to Joplin, Mo. The right of way is now being secured for the Denison line. The company has bought a tract of land on Blue river, in Johnson county, having sufficient water power to operate the entire line. Martin J. Bentley, Shawnee, is president; C. C. Wright, Ada, secretary; P. Rodkey, Shawnee, right-of-way agent, and H. H. Hull, Memphis, Tenn., chief engineer.

SOUTHERN CAMBRIA (Electric).—This company is said to have begun grading work on an extension between Johnstown, Pa., and Ebensburg, 10.85 miles.

SUMPTER VALLEY.—This company will build an extension, it is said, from Prairie City, Ore., west to John Day.

TEXAS ROADS.—Plans are being made by residents of Fort Worth, Texas, to build from that place, northwest to Jacksboro, 60 miles. The line may eventually be extended into New

Mexico. It is understood that construction work will be started soon. W. Capps, S. Davidson, I. H. Burney and W. D. Reynolds, are interested.

TEXAS TRACTION.—According to press reports, plans are being made to build an extension from Dallas, Texas, south to Waxahachie, about 35 miles. Surveys for a line between these places were made about two years ago, but nothing was done toward the construction of the line. It is expected that the work will be pushed to completion soon, and when this work is finished a further extension south may be built through Hillsboro to Waco, about 65 miles.

UNCOMPAGHRE & GUNNISON VALLEY.—An officer writes that contracts will probably be let this summer to build from Montrose, Colo., north through a fruit section via Clathe and Delta, about 50 miles. The line will have maximum grades of 3 per cent. and maximum curvature of 8 deg. There will be a trestle over the Gunnison and another over the Uncompahgre river. The line is being built to carry coal, sugar, beats, live stock and fruit. T. B. Townsend, president, Denver; Paret & Beard, engineers, Box 667, Montrose.

WASHINGTON ROADS (Electric).—A company is to be organized by residents of Springdale, Wash., and Spokane, under the name of the Chamokane Contracting Company, to build an electric line from Springdale, to the proposed power plant of the Washington Water Power Company, on the Spokane river. The line will be built if the company is able to secure the right-of-way.

WEST PENN RAILWAYS COMPANY (Electric).—This company, it is said, will issue bonds, the proceeds of which are to be used for extensions in Pennsylvania as follows: Leisenring-Uniontown line; West Newton to Hunkers, 10 miles; West Newton to Scott Haven, six miles; West Newton to Webster, seven miles; Webster to Monessen, three miles; Brownsville to Arnold City, six miles, and Fairchance to Point Marion, eight miles, a total of 52 miles. Surveys have not yet been made for these extensions.

WICHITA & MIDLAND VALLEY.—See Midland Valley.

WINNIPEG, SALINA & GULF.—An officer writes that this company, which was organized to build from Winnipeg, Man., south to the gulf of Mexico, 1,500 miles, expects to let contracts in May and financial arrangements will be completed to secure funds for starting the work by that time. The final location surveys are being made from Alva, Okla., west via Buffalo and Gate to Beaver City, about 100 miles. Survey has been finished from Alva to Hooker, but it will be necessary to resurvey this line. The location survey from Cunningham, Kan., almost to Salina, has been made. Arrangements have been made with the Marine Trust & Savings bank, San Francisco, Cal., to guarantee the principal of all stock sold where the money is used for preliminary purposes. There will be five steel bridges and a large amount of trestle work is to be carried out on the line. The company also plans to put up a general office building as well as machine shops. H. Leone Miller, president; G. W. Crowell, vice-president, and C. A. Slayton, chief engineer, Salina, Kan.

FOREIGN RAILWAY NOTES.

The total mileage of the Belgian government railways on January 1, 1910, was 1,268 miles of double track and 1,410 miles of single track.

The Japanese railways at the close of their last fiscal year had 5,029 miles of line, of which more than nine-tenths belonged to the state. Their average traffic was equivalent to 796 passengers and 506 tons of freight carried each way daily over the entire system. The gross earnings were \$8,320, and the net \$3,860 per mile.

The Jungfrau Railway, Switzerland, continues to make its way upward. The drilling goes on night and day at a height of about 10,800 ft. above sea level, and the tunnel is extended some 11 to 13 ft. daily. At the next station a great "window" is to be cut out on the north side, immediately over the Guggi glacier.

Railway Financial News.

BOSTON & MAINE.—See Boston Railroad Holding Company.

BOSTON & MAINE.—See New York, New Haven & Hartford.

BOSTON RAILROAD HOLDING COMPANY.—The Massachusetts Railroad Commission has approved the petition of the holding company to issue \$7,042,400 4 per cent. preferred stock to pay for \$6,334,500 Boston & Maine common stock.

CHESAPEAKE & OHIO.—The attorney general of Ohio, acting under the Valentine anti-trust law, has brought suit to exclude the Chesapeake & Ohio from the state of Ohio, and to have trustees appointed for the Hocking Valley and Kanawha & Michigan. The Hocking Valley and the K. & M. are Ohio corporations, but the C. & O. is not an Ohio corporation.

CHICAGO, BURLINGTON & QUINCY.—This company has sold to a New York banking syndicate headed by the First National Bank, \$8,000,000 general mortgage 4 per cent. bonds, the proceeds to be used for general development purposes. These bonds are now selling in the market at between 97 and 98. The new Burlington bonds are being offered in Boston at 97½. It is understood that a portion of the proceeds will be used to refund a maturing issue of Hannibal & St. Joseph 6s coming due March 1.

ERIE.—This company has asked the New York Public Service Commission, Second district, for authority to issue \$12,500,000 collateral notes and \$1,382,000 general lien bonds. The proceeds from the sale of the notes will be used to retire outstanding three-year 6 per cent. collateral notes due April 8.

GULF & SHIP ISLAND.—The \$500,000 6 per cent. mortgage bonds due April 1, 1911, are to be paid at maturity. Fisk & Robinson, New York, have bought from the company \$500,000 of a new authorized issue of \$1,000,000 general and refunding 6 per cent. mortgage bonds of 1913-1917, and are offering the holders of the old bonds the privilege of exchanging their bonds at par and interest, for new bonds at 99½.

HOCKING VALLEY.—See Chesapeake & Ohio.

KANAWHA & MICHIGAN.—See Chesapeake & Ohio.

INDIANAPOLIS SOUTHERN.—The trustees of the mortgage securing \$10,000,000 bonds, all of which are owned by the Illinois Central, have brought a foreclosure suit. The United States Circuit Court has entered a decree in Illinois providing that unless the company paid \$11,056,698, the amount found to be due, by February 19, 1911, the mortgage would be foreclosed and the property sold.

MOBILE & OHIO.—Henry Hall and A. W. Mackintosh have been elected directors, succeeding E. L. Russell, deceased, and E. J. Buck, resigned.

NEW YORK CENTRAL & HUDSON RIVER.—See New York, New Haven & Hartford.

NEW YORK, NEW HAVEN & HARTFORD.—The Vermont Valley Railroad, a subsidiary of the Boston & Maine, which is itself controlled by the New Haven, has bought \$2,352,050 preferred stock of the Rutland Railroad. Heretofore the New York Central & Hudson River has owned a majority of the \$9,057,600 7 per cent. cumulative preferred stock outstanding. It is generally understood that the stock bought by the Boston & Maine subsidiary is about half of the New York Central's holdings.

The appraisers appointed by the Massachusetts legislature to make an inquiry as to the valuation of the property of the New York, New Haven & Hartford have filed their detailed report. As announced in these columns previously, the appraisers find that the value of the property exceeds the securities issued on this property. The appraisers' figures now show that they estimate the property of the New Haven, excluding intangible assets, at \$496,000,000, while the total obligations of the company are \$340,000,000.

NEW YORK, ONTARIO & WESTERN.—White, Weld & Company, and Potter, Choate & Prentice, New York, are offering the unsold portion of the \$2,702,000 general mortgage 4 per cent. bonds at 92½, yielding about 4¾ per cent.

PEORIA & EASTERN.—The full 4 per cent. annual interest of the \$4,000,000 non-cumulative income bonds has been declared payable April 1. Four per cent. was paid in 1910, but nothing was paid in 1909. From 1902 to 1908, inclusive, the full 4 per cent. was paid.

PITTSBURG & SHAWMUT.—The *Commercial & Financial Chronicle* says that the company will sell within two months a further block of first mortgage 5 per cent. bonds, to provide for the completion of the road to Freeport, Pa. There are now outstanding \$4,000,000 bonds of the authorized issue of \$12,000,000.

RUTLAND RAILROAD.—See New York, New Haven & Hartford.

SOUTHERN RAILWAY.—A dividend of 1 per cent. has been declared payable April 24 on the \$60,000,000 5 per cent. non-cumulative preferred stock. In the fiscal year ending June 30, 1907, 4 per cent. was paid; the last payment in 1907 being 1½ per cent. paid from accumulated surplus. From 1902 to 1906, inclusive, 5 per cent. was paid.

President Finley says that he has been authorized by the board to take up the question of the purchase of additional power and equipment, to construct a system of modern "lap" sidings on two important divisions where traffic is heavy, but not sufficient to require double-tracking now, and to improve certain large facilities. In order to strengthen the position of the company with reference to increasing its business, the board has also authorized improvement and expansion of freight facilities at important points.

President Finley says:

"The financial condition of the company having so improved, as shown by the last annual report and the income statement for the six months ended December 31, 1910, as to make such action entirely consistent with a sound and conservative policy, the directors have declared a dividend out of accumulated income as a fair recognition, under all the circumstances, of the just expectations of holders of preferred stock who received dividends for a series of years until the conditions which culminated in the financial panic of the fall of 1907 and the subsequent business depression compelled their suspension. The board has adopted the policy of resuming dividends on a very conservative basis in the expectation that with a continuance of favorable conditions the rate may be gradually increased until the full dividend can again be properly paid. This resumption will not result in any modification of the progressive policy with respect to operation, maintenance and improvement of the property.

It is the expectation to continue the policy of charging to income monthly proportionate amounts of the present balance of discount on securities sold and of making a substantial charge to profit and loss at the end of each fiscal year until such present decreasing balance of discount has been absorbed."

WASHINGTON, BALTIMORE & ANNAPOLIS.—The United States District Court at Baltimore has ordered the sale of this property under foreclosure. The upset price is \$2,500,000.

FOREIGN RAILWAY NOTES.

More than 1,266 miles were added to the railway systems of Argentina during 1910, not including government lines under construction.

The Argentine congress has approved the bill authorizing the government to spend \$19,300,000 on the construction and equipment of state railways.

The Austrian state authorities at the end of 1910 were operating 11,939 miles of railway, of which 3,224 miles were owned by companies, but operated by the state.

Work on the new railway from the port of San Blas, Argentina, to Patagones and Choele-Choele was begun in January. A French syndicate has the contract.

According to the statement of the director general of railways of Argentina the narrow-gauge lines produced \$18,669,890 and spent \$13,647,995 during 1910. The medium-gauge lines produced \$4,356,975 and expended \$2,541,810. The wide-gauge railways produced \$80,049,545 and expended \$45,326,050.

Supply Trade Section.

The Allis-Chalmers Company, Milwaukee, Wis., announces the appointment of F. C. Bryan as general traffic manager, with office at Milwaukee.

The F. W. Miller Heating Company, Chicago, on March 1 will move its Chicago offices from the Railway Exchange building to the McCormick building.

The Union Steel Castings Company, Pittsburgh, Pa., has bought some ground adjoining its present property and intends to build a new plant as soon as possible.

Frank J. Walsh, general foreman of the Chesapeake & Ohio at Thurmond, W. Va., has resigned that position and is now with the Chicago Pneumatic Tool Company, Chicago.

The Buda Company, Chicago, was awarded the gold medal at the Railway Exposition which has just closed at Buenos Aires, Argentine Republic, on its line of motor cars, motor velocipedes, hand-propelled velocipedes, hand cars, track jacks, rail benders, car replacers, new style Palulus track drills, and Wilson bonding drills.

The McKen Motor Car Company, Omaha, Neb., has received orders from the Oregon Short Line for four 70-ft. motor cars and from the Oregon-Washington Railroad & Navigation Company for one 70-ft. motor car. When these are delivered there will be 104 cars of the McKen type in service.

At the annual meeting of Manning, Maxwell & Moore, New York, on February 13, W. O. Jacquette and R. A. Bole were elected vice-presidents, succeeding Charles A. Moore, Jr., and J. B. Brady. Mr. Moore also resigned as secretary and as a director, and C. M. Chester, Jr., treasurer, was made also secretary. Mr. Brady remains a director.

At the annual meeting of the King-Lawson Car Company, New York, held at Harrisburg, Pa., on February 8, the following officers were elected: President and general manager, Thomas Lawson; vice-president, A. L. Squiers; treasurer, John M. Delaney; secretary, Roscoe C. Lawson; directors, Edward Bailey, Arthur King and Curtis M. Rogers. The New York offices of the company were moved on February 20, from 1 Madison avenue, to the Singer building.

The circuit court for the county of Saginaw, Michigan, has rendered a decision in the case of the Willcox Engineering Co., Saginaw, Mich., against Harley C. Alger, dissolving the injunction granted to restrain Mr. Alger from allowing the use of his patents on water weighers by the Kennicott company, Chicago Heights, Ill. Mr. Alger is the inventor of the Kennicott water weigher, and is at present manager of the water weigher department of the Kennicott Company.

L. F. Hussey, manager of publicity for the Wells Brothers Company, Greenfield, Mass., has resigned, effective February 25, and will on March 1 become advertising manager of the Standard Tool Company, Cleveland, Ohio. Mr. Hussey has had considerable practical experience in the manufacture of machinery and tools, and has also had charge of the commercial department of a high school at Mechanicsville, N. Y. Two years ago he left that position to create a publicity department with the Wells Brothers Company, and is now undertaking work of even larger scope.

The Pressed Steel Car Company, Pittsburgh, Pa., has issued its report for the year ended December 31, 1910. The gross sales amounted to \$27,975,978, as compared with \$10,346,816 in 1909. The net earnings from the operation amounted to \$1,697,495 in 1910; there was a deficit in 1909. The net surplus for 1910 was \$693,366, or 5.54 per cent. on the \$12,500,000 common stock, as compared with a \$959,583 surplus in 1909, after \$1,200,000 had been received from the sale of the common stock of the Canada Car Company. The dividends on the preferred stock amounted to \$875,000. President, F. N. Hoffstot says that the company is now in a position to build cars at the very lowest cost in the history of the company.

Frank S. Layng, a director and formerly a vice-president of the Railway Steel-Spring Company, New York, died on February 11. Mr. Layng was born in Steubenville, Ohio, on July 4,

1854. He started work in the steel spring business with the A. French Spring Company, Pittsburgh, Pa., in 1883. He obtained an interest in this company and was made superintendent. In 1886 Mr. Layng resigned this position, though retaining his interest, and went to the Pickering Spring Company, Philadelphia, Pa. He also bought an interest in this company from Charles W. Pickering, the president, and was made secretary and treasurer. Mr. Layng then bought the remainder of Mr. Pickering's interest and remained in full control of this company as chairman of the board until it was bought by the Railway Steel-Spring Company in 1902. On the reorganization of the Railway Steel-Spring Company, Mr. Layng was elected a director and a vice-president in charge of the operating department. On February 28, 1903, he resigned his position as vice-president to look after his own interests, but retained his directorship, which he held at the time of his death. Mr. Layng was also president of the Illinois Zinc Company, Peru, Ill.

TRADE PUBLICATIONS.

Wires, Switches, Generators.—The General Electric Company, Schenectady, N. Y., in bulletin No. 4,787, containing 75 pages of data on wires and cables. Bulletin No. 4,813 describes an oil brake switch for pole line service adapted for use on alternating current series arc systems for sectionalizing feeder systems and similar classes of service requiring a switch to be operated under load. Bulletin No. 4,812 is devoted to small direct current belted generators, ranging in capacity from 1¼-k.w. to 20-k.w., and suitable for lighting small plants, factories, etc.

RAILWAY STRUCTURES.

BASSANO, ALBERTA.—The Canadian Pacific has let a contract for building a dam on the Bow river as part of its irrigation system. Janse, Macdonnell & Company will do the excavating work and Walker, Fyshe & Company the concrete work.

CENTRALIA, ILL.—The Chicago, Burlington & Quincy has announced that the present station buildings will be moved on May 1 to make room for a new passenger station, the property for which has recently been secured by condemnation proceedings.

CLEBURNE, TEXAS.—The Gulf, Colorado & Santa Fe has announced that \$60,000 will be spent in enlarging its shops.

COEUR D'ALENE, IDAHO.—The Chicago, Milwaukee & Puget Sound has completed its plans for a terminal station, and it is expected that construction work will begin at an early date.

EMPIRE, PANAMA.—The engineering board appointed to investigate conditions along the Panama canal favors the construction of a bridge 175 ft. above the surface of the canal at Empire, where convenient connections can be made with the Panama Railroad. The bridge, if built, is to be a combined railway and highway bridge.

HARTFORD CITY, IND.—The city council has refused to close South High street as requested by the Pennsylvania Railroad in its plan for a \$40,000 passenger station, and local press reports state that on this account a contract has been let for building a frame station 20 ft. x 40 ft. to cost less than \$500.

TORONTO, ONT.—An officer of the Canadian Pacific is quoted as saying that the company is planning to spend \$5,000,000 in Toronto; of this \$2,000,000 is to be spent in North Toronto, West Toronto yards, and on a new station at North Toronto, also new yards between Parkdale and West Toronto. About \$2,000,000 has already been spent in securing property between Sincoe and Tecumseh streets, including the Government House site, and \$1,000,000 will be spent on the new office building at the corner of King and Yonge streets.

WICHITA FALLS, TEXAS.—The Fort Worth & Denver City will begin work on its new freight house as soon as the passenger department has moved into the new union station, allowing the present office building to be torn down. The new freight house will be 30 ft. x 175 ft. and will be supplied with increased track-age facilities.

Late News.

The items in this column were received after the classified departments were closed.

W. J. Robinson has been appointed a soliciting freight agent of the Union Pacific and related lines, with office at Los Angeles, Cal., a new position.

P. F. Bright, assistant trainmaster of the Sunbury division of the Pennsylvania Railroad, at Sunbury, Pa., has been appointed trainmaster, succeeding Jacob H. Swenk, deceased.

A press despatch from Elko, Nev., says 20 passengers were injured in a derailment near Palisade, Nev., of the Southern Pacific train No. 10 eastbound. Seven cars ran off the track.

The St. Louis & San Francisco expects to open for traffic on February 25 the extension from Brady, Tex., to Menard, 37 miles. The line may ultimately be extended south to a connection with the Southern Pacific.

The Chicago & Northwestern has ordered 40,000 tons of rails from the Illinois Steel Company. The Manila Railways are in the market for 10,000 tons of rails. The Buenos Ayres & Pacific, Argentina, has ordered 15,000 tons of rails.

A rumor says that the Interstate Commerce Commission, in an all-day session on February 22, took the final vote on both the eastern and western rate cases, and that the decision will be prepared and handed down late Thursday or early Friday.

A contract has been given by the St. Louis-Kansas City Electric, it is said, to the L. J. Smith Construction Co., Kansas City, Mo., for building 140 miles of line, between St. Louis and Kansas City. A 10-mile branch is to be built from Columbia to Harrisburg. D. C. Nevin, president, Kansas City.

Officers of the Southern Pacific deny the Washington report that the company has offered to settle suits brought by the government to recover 70,000 acres of Nevada mineral lands granted to the Central Pacific. The railway men say that the S. P. title to these lands is too clear to justify any compromise.

The Dairy Shippers Despatch, Chicago, has ordered 100 thirty-ton refrigerator cars. The Chicago, Indianapolis & Louisville inquiry includes 200 flat cars and 100 automobile cars. The American Refrigerator Transportation Company, St. Louis, Mo., is said to have ordered 1,000 refrigerator cars from the American Car & Foundry Company.

The Interstate Commerce Commission has further suspended the time its order goes into effect in the case of Pacific Coast Jobbers' Association v. Southern Pacific, to May 1, and in the case of the Associated Jobbers of Los Angeles v. Atchison, Topeka & Santa Fe, also to May 1, in order that the Commerce Court may pass upon them.

Justice Parker, in the English court, has decided that the Marconi Wireless Telegraph Co. is entitled to an injunction against the British Radio Telegraph & Telephone Co. to restrain it from infringements of the Marconi patents. He found that the instruments used by the British company were substantially the same as those covered by Mr. Marconi's patents.

The New York Public Service Commission, second district, has given permission to the Erie to issue \$12,500,000 in three-year 6 per cent. collateral notes and \$1,382,000 of its 4 per cent. general lien bonds. The proceeds are to be used in discharging notes and to reimburse the company for moneys spent from income, amounting to \$2,006,032.

The *Liverpool Post* says that the Cunard Steamship Co. and the Canadian Northern have decided to run steamships to Canada from Bristol and probably also from Liverpool. A joint board to consist of directors of both companies will have charge of the arrangements. The formation of this combination is understood to be a counter move to one recently made by the Canadian Pacific.

The Reading & Columbia will replace the present 93-ft. wooden truss bridge over the public road and streams at Ephrata, Pa., with two deck plate girder spans and will also replace the 68-ft.

wooden truss bridge north of Shreiners over the public road and creek with a through plate girder span. The contracts for additions and changes to masonry have been given to L. H. Focht & Son, and for the superstructure to the Phoenix Bridge Co.

An officer of the Pennsylvania, referring to reports of retrenchment, says that the company has cancelled no orders for materials or equipment, nor is it contemplated to do other than to reduce operating forces and expenses as is usual in the spring of each year. As weather conditions in January permitted a normal freight movement, and as there is no accumulation of freight, the annual spring reduction in expenses is made somewhat earlier than usual.

A report of Travis B. Whitney, secretary of the New York Public Service Commission, second district, says that 127 formal complaints were made in January against the street railway lines of the various boroughs and against the Fifth Avenue Coach Company. Most of the practices complained against were remedied without formal hearings. The number of complaints made by passengers was as follows: Brooklyn Rapid Transit System, 40; Interborough Rapid Transit Company, 25; Metropolitan Street Railway Company, 10; Fifth Avenue Coach Company, 6; Central Park, North & East River Railroad Company, 5; Coney Island & Brooklyn Railroad Company, 3; New York & Long Island Traction Company, 3; New York & Queens County Railroad Company, 3; Union Railway Company, 3; Forty-second Street, Manhattanville & St. Nicholas Avenue Railway Company, 2; Ocean Electric Railway Company, 2, and New York, New Haven & Hartford Railway Company, 2.

In accordance with the resolution passed by the Chicago city council on February 14, providing for the appointment of a railway terminal commission (see *Railway Age Gazette*, February 17, page 328), Mayor Busse has appointed the following: A. J. Earling, president Chicago, Milwaukee & St. Paul; W. A. Gardner, president Chicago & North Western; Samuel M. Felton, president Chicago Great Western; H. U. Mudge, president Chicago, Rock Island & Pacific; H. G. Hetzler, president Chicago & Western Indiana; W. L. Park, vice-president and general manager Illinois Central; Aldermen Foreman, Snow, Clettenberg, Sitts, Rea, Healy, Murray, Littler, Cullerton, Ryan, Reinberg, Powers and Richert; Charles H. Wacker, chairman of the Chicago plan commission; John G. Shedd, representing retail merchandise interests; Arthur T. Aldis, of the Chicago real estate board; E. S. Conway and Clayton Mark, of Mayor Busse's "switch track commission," and Walter H. Wilson, city comptroller.

In the case of Arlington Heights Fruit Exchange et al. v. Southern Pacific et al., the Interstate Commerce Commission has found in favor of the fruit growers. The decision says that the carrying rates for refrigeration of oranges from California to eastern points are not unreasonable, but refrigeration and pre-cooling as practiced by the shippers differs from that furnished by the carriers. The two methods are discussed and the conclusion reached that while it cannot be affirmed with entire confidence that pre-cooling can take the place of standard refrigeration under all circumstances, it is evident that the great bulk of the orange crop may be moved by pre-cooling as applied by the shippers. On the facts disclosed by the record it is found that pre-cooling at the packing house is a practical method which the complainants are anxious to use and for the efficiency of which they are willing to stand responsible, while the method advocated by the carriers is of doubtful practicability and one which the complainants do not care to use and which the defendants are unwilling to guarantee. The service of pre-cooling as these shippers desire to use it can only be performed by the shippers themselves, and the commission thinks that upon the present record it is the right of these complainants to pre-cool and re-ice their shipments. If, however, the carrier has been put to additional expense in the furnishing of the car or in handling the shipment, it should be allowed proper compensation on that account. Carriers are not in case of these pre-cooled shipments entitled to additional compensation because a refrigerator car is furnished, but they are entitled for repairs to ice bunkers to an additional charge per car trip one way. At present the roads charge \$30 a car for pre-cooling storage and the commission reduces this charge to \$7.50 per car effective April 1.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Grand Rapids & Indiana is in the market for 6 locomotives.

The Delaware, Lackawanna & Western is in the market for 35 locomotives.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for 2 heavy mogul locomotives.

The Bessemer & Lake Erie has ordered 30 consolidation locomotives from the American Locomotive Company. The cylinders will be 22 in. x 30 in., the diameter of the driving wheels will be 54 in. and the total weight in working order will be 205,000 lbs.

The Idaho & Washington Northern has ordered 2 consolidation locomotives from the Baldwin Locomotive Works. The cylinders will be 22 in. x 30 in., the diameter of the driving wheels will be 55 in. and the total weight in working order will be 200,000 lbs.

McDonnell & O'Brien, Hervey Junction, Que., have ordered two mogul locomotives from the Montreal Locomotive Works. The cylinders will be 19 in. x 26 in., the diameter of the driving wheels will be 50 in. and the total weight in working order will be 130,000 lbs.

The Inland Steel Company, Chicago, has ordered one six-wheel switching locomotive from the American Locomotive Company. The cylinders will be 17 in. x 24 in., the diameter of the driving wheels will be 44 in. and the total weight in working order will be 94,000 lbs.

The American Brake Shoe & Foundry Company, Mahwah, N. J., has ordered one four-wheel saddle tank locomotive from the American Locomotive Company. The cylinders will be 16 in. x 24 in., the diameter of the driving wheels will be 46 in. and the total weight in working order will be 86,000 lbs.

The Chicago, Indianapolis & Louisville has ordered seven consolidation and three Pacific type locomotives from the American Locomotive Company. The cylinders of the consolidation locomotives will be 22 in. x 30 in., the diameter of the driving wheels will be 57 in., and the total weight in working order will be 209,000 lbs. The cylinders of the Pacific type locomotives will be 22 in. x 28 in., the diameter of the driving wheels will be 73 in., and the total weight in working order will be 215,000 lbs.

CAR BUILDING.

The Southern is in the market for four dining cars.

The Escanaba & Lake Superior has ordered 15 flat cars from the Ryan Car Company.

The Virginian has ordered 1,000 steel hopper cars from the Pressed Steel Car Company.

The Richmond, Fredericksburg & Potomac is in the market for 50 box cars and 50 flat cars.

The Great Northern is in the market for ten 60-ft. passenger cars, ten 70-ft. baggage and mail cars, and 15 baggage cars.

The Northern Pacific is in the market for 18 passenger equipment cars, including coaches, baggage cars and dining cars.

The Chicago, Rock Island & Pacific is in the market for 16 steel postal cars and 11 combination mail and baggage cars.

The Pennsylvania Equipment Co., Philadelphia, Pa., is in the market for a number of flat cars, box cars, dump cars and cabooses.

The Boston & Maine, mentioned in the *Railway Age Gazette* of January 6 as being in the market for 300 passenger cars, has ordered 88 of these cars from the Laconia Car Company.

The Atlanta & West Point has ordered six passenger equipment cars from the American Car & Foundry Company, two of which are for service on the Western of Alabama.

The Lehigh & New England, mentioned in the *Railway Age Gazette* of January 27 as being in the market for 500 hopper cars and 300 box cars, has placed these orders. The 500 steel hopper cars were ordered from the Cambria Steel Company, while the American Car & Foundry Company will make the 300 steel underframe box cars.

IRON AND STEEL.

The Canadian Pacific is said to be in the market for 100,000 tons of rails. This is not confirmed.

The Interborough Rapid Transit Co. has ordered 5,000 tons of rails from the Lackawanna Steel Company.

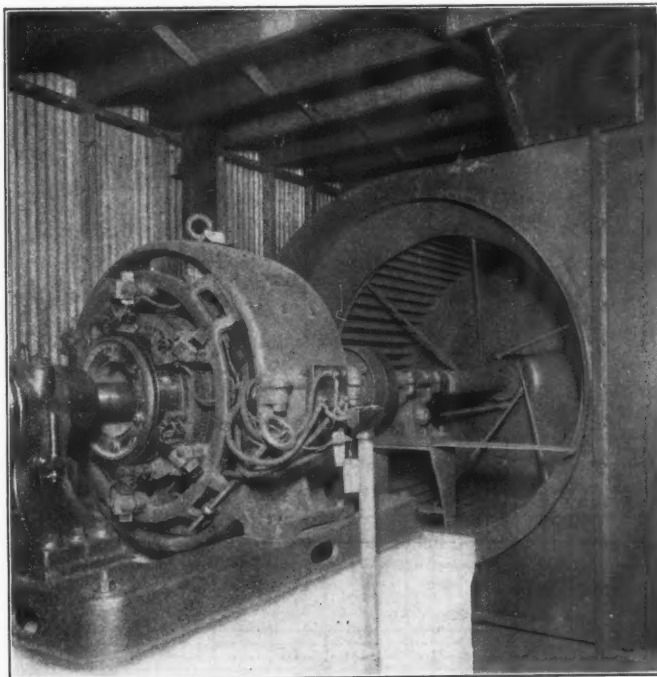
The Isthmian Canal Commission will receive bids until March 3 on miscellaneous supplies, including manganese steel castings, steel castings, wire rope, etc. Circular No. 622. Bids on chain, wire rope, etc., will be opened on March 6. Circular No. 622-A.

General Conditions in Steel.—The buying movement in the steel industry has assumed an aspect of permanency during the past week, which was not the case earlier in February. As long as the buying was confined to the large interests, including the railway orders that have been so long delayed, there were skeptics in the steel trade; but now the smaller consumers and the jobbing trades have come into the market with liberal requisitions; and the market is physically strengthened by these evidences of increased consumption. The bookings of the United States Steel Corporation amount to 30,000 tons a day. The improvement in the industry is largely due to the increase in export business during the last two months.

Tunnel Ventilation

BY ARTHUR RITTER.

About two months ago the Hudson & Manhattan installed at its Washington street power house, Jersey City, N. J., a large Sirocco fan, for the ventilation of the Hudson tunnels in that vicinity. This fan was supplied by the American Blower Company of Detroit, Mich. The apparatus consists of a No. 13 double inlet Sirocco full housed fan, with a blast wheel 78 in. in diameter by 78 in. wide at the periphery containing 64 blades.

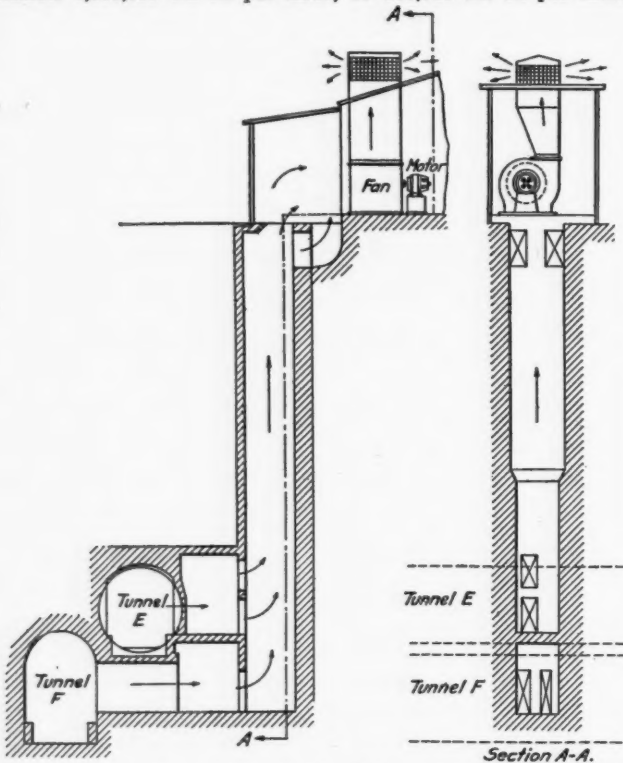


Sirocco Fan for Hudson Tunnels.

Directly attached to the fan shaft by means of a flexible flanged coupling is a 40-h.p. Sprague, slow speed motor, wound for 600 volts direct current. The normal speed is 175 r.p.m. and the maximum speed 200 r.p.m.

The outfit was erected in an air-tight room, the air being exhausted from the tunnels E and F through the air-ways and

shaft, as shown on the accompanying drawing. There are no connections or ducts between the fan inlets and the air shafts, the air velocity being produced by the suction head maintained in the fan room. The fan discharges through an evase stack having a screened outlet hood, similar to those used on mine ventilating fans. The fan was required to exhaust from the tunnels 6,000,000 cu. ft. per hour, or 100,000 cu. ft. per minute.



Ventilating Shaft for Hudson Tunnels.

A complete pitot tube test of the equipment was made by the engineering department of the railway, the results of which are tabulated below. Readings were taken at the inlet as well as the outlet.

	TEST.			
	Reading in stack.	Reading at inlet.	Reading in stack.	Reading at inlet.
Fan, No. 13 D. I. Sirocco.				
Manufacturer—Am. Blower Co.				
Date of test.....	12/14/10	12/15/10	12/14/10	12/15/10
Speed of motor—r.p.m.....	179	175	200	199
E.M.F.—volts.....	615	615	615	615
Current—amp.....	43	42	58	59
Electric h.p. of motor.....	35.5	34.6	47.8	48.6
Assumed efficiency of motor, per cent.....	80	80	80	80
Brake h.p. of motor.....	28.4	27.7	38.1	39
Speed at periphery of fan wheel, f.p.s.....	61	59.6	68.1	67.9
Pressure at point of test, vel. inches w.g.....	.17	.21	.22	.31
Pressure at point of test, static inches w.g.....	.....	.78	.....	.94
Pressure at point of test, dynamic inches w.g.....	.....	.99	.....	1.25
Static resistance from point of test to fan or outlet, est. inches w.g.....	.....	0	.....	0
Total dynamic pressure.....	.....	.99	.....	1.25

	TEST.			
	Reading in stack.	Reading at inlet.	Reading in stack.	Reading at inlet.
Fan, No. 13 D. I. Sirocco.				
Manufacturer—Am. Blower Co.				
Area of duct at point of test.....	67.6	59.8	67.6	59.8
Vel. of air at point of test.....	1,640	1,820	1,865	2,215
Vol. of air in cu. ft. per min.....	110,000	109,000	126,000	133,000
Area of duct at fan outlet.....	38.3	38.3	38.3	38.3
Area of duct at smallest section.....	33.5	33.5	33.5	33.5
Vel. pressure at smallest section.....	.....	.67	.....	.....
Theoretical h.p. of air.....	.....	16.9	.....	25.9
Efficiency of fan.....	.....	61	.....	66.5

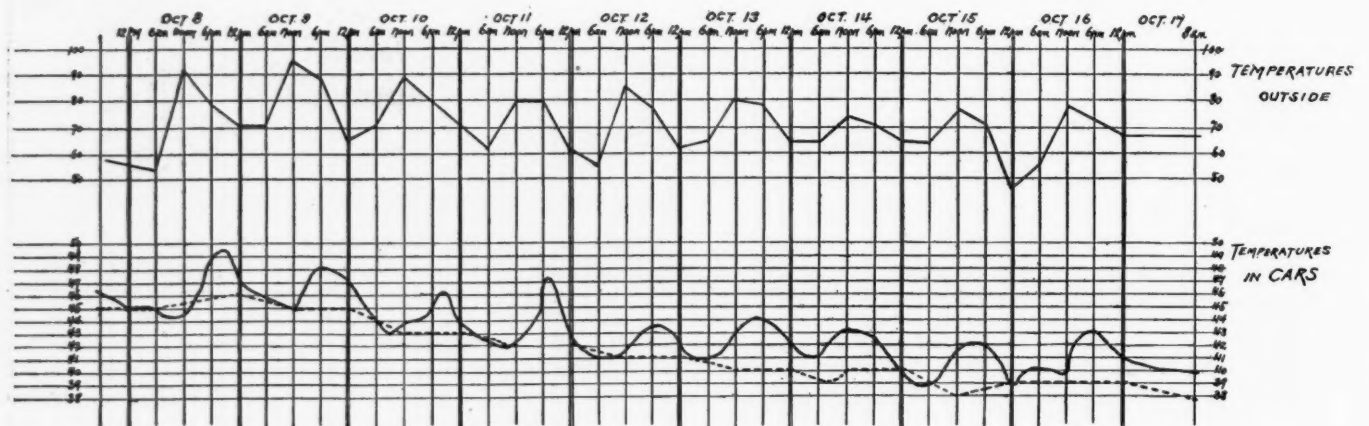
NOTE.—All pressures in inches water gage.

It will be noted from the above test that the volumetric efficiency of the fan was greater than estimated, the capacity running 30 per cent. above the stipulated amount. The power required to drive the outfit was low, as compared with the volume of air handled and the total pressure maintained, illustrating the high mechanical efficiency established with this fan.

Linofelt Flax Fiber Insulation for Refrigerator Cars.

The insulation used for more than half the refrigerator cars on western lines is Linofelt flax fiber, made by the Union Fibre Company of Chicago. Reports of tests which show the benefit of this material in the saving of ice and the maintenance of even temperatures inside the car have been published in the *Railway Age Gazette* of October 30, 1908, and February 12, 1909. These and other tests show the advantage of using more layers of insulation than are usually employed. Many car builders, as a matter of economy in the first cost of cars, provide only two thicknesses of insulation, but not less than four thicknesses should be used; and more economical results are obtained by the use of six layers of Linofelt. A recent test made in the summer months with heavy insulation by a transcontinental line shows that the addition of only one extra layer of Linofelt made a saving of a ton of ice per car per trip from the fruit district of California to Pacific Junction, Ill. The better temperature regulation obtained is shown by the thermograph chart which is here illustrated and which was made from readings obtained from a clock record on a refrigerator car from Los Angeles, Cal., and Chicago. One car had two thicknesses of Linofelt, and the other had six thicknesses. The saving in ice amounted to 2,500 lbs. The temperature of the fruit after pre-cooling was 51 deg. F. The temperature outside was measured by a thermometer, and observations were made every six hours. The upper line in the chart shows the fluctuation in outside temperature, which was lowest about midnight and highest at noon. The full lower line shows the temperature in the interior of the car with only two thicknesses of Linofelt, and although it remained down to about 45 deg. F., it followed the changes of the outside air as indicated by the upper line. The dotted line indicates the more uniform temperature of the air as obtained inside the car having six layers of Linofelt. The extra layers of felt cost about \$42 per car for each layer, and the higher value of the fruit taken from such a car will soon pay for the extra expense.

The development of refrigerating engineering has led in the last five years to a careful study of the economy of heavy insulations in cold storage buildings. This idea of increasing the insulation in refrigerator cars, therefore, is in line with modern scientific thought.



Thermograph Records for Refrigerator Cars; Los Angeles, Cal., to Chicago.